

Hurricane Awareness Workbook

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Federal Emergency Management Agency / National Oceanic and Atmospheric Administration - U.S. Department of Commerce

ATTENTION HURRICANE AWARENESS CAMPAIGN PLANNER'.

No atmospheric disturbance combines duration, size, and violence more destructively than a hurricane. Driving winds, torrential rain, and lethal storm surges combine to threaten coastal and inland communities each year. The public must be appropriately warned and adequately prepared to survive these storms.

The Federal Emergency Management Agency (FEMA), in conjunction with the National Oceanic and Atmospheric Administration (NOAA), has developed a Hurricane Awareness Workbook to help you educate and prepare people living in the nation's coastal regions.

The Hurricane Awareness Workbook provides information from innovative projects throughout the country. A RESOURCES section contains names of people and organizations with experience in conducting hurricane awareness campaigns. Also included in this section are a monograph highlighting the successful efforts of various state and local governments and business and industry in innovative hurricane awareness/education programs, a bibliography, and a planning guidebook.

A MEDIA chapter contains background information on hurricanes as well as sample radio scripts and newspaper articles that can be adapted for local use. Sample MATERIALS FOR THE PUBLIC are also included in the Workbook—brochures, newspaper supplements, tracking charts.

While most of the materials in this package are available in limited bulk quantities, we encourage a self-help approach at the local level. You should include key representatives of community organizations, emergency service officials, weather forecasters, and police, fire, and rescue personnel in your efforts. Members of the local media are also vital resources to a successful campaign. Daily and weekly newspapers, television and radio stations are important communications vehicles—necessary elements in preparing your community for a hurricane. Involve local business and industry in your campaign activities; they are excellent sources of support for producing and distributing vital safety information. Also, check with neighboring communities and counties on their activities in hurricane awareness. Combining the resources in a region can save both money and time.

The FEMA Office of Public Affairs is willing to aid you in your program. If you wish to discuss specific problems, you can call or write us or your FEMA regional office.

Good luck in your campaign'.



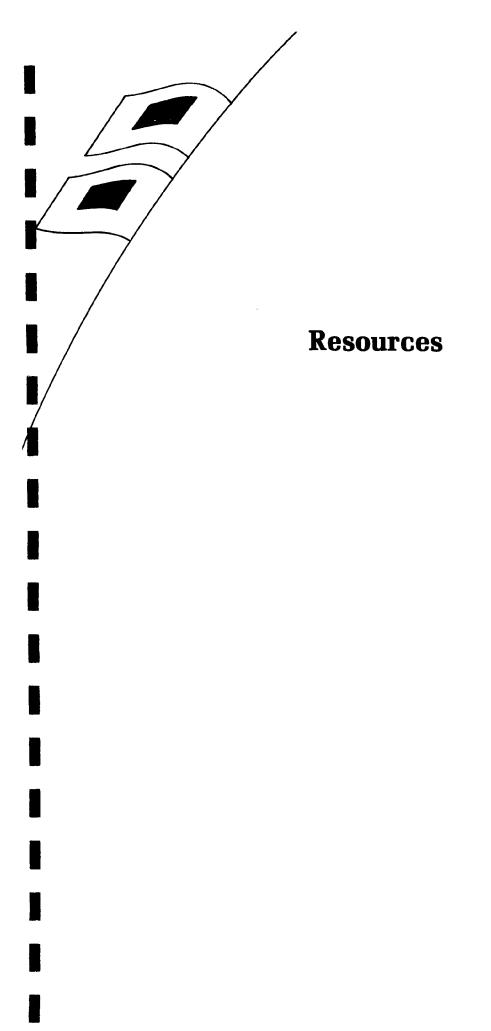


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People and Organizations





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RESOURCES

People and Organizations

General Information

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FEMA Region I Public Information: Ken Horak 442 J.W. McCormack POCH Boston, Massachusetts 02109 (617) 223-4741

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FEMA Region V 300 S. Wacker Drive 24th Floor Chicago, Illinois 60606 (312) 353-8661 Maine, Vermont, New Hampshire, Massachusetts, Connecticut, Rhode Island

New York, New Jersey, Virgin Islands, Puerto Rico

Pennsylvania, Delaware, Maryland, West Virginia, Washington, D.C., Virginia

Kentucky, North Carolina, South Carolina, Tennessee, Mississippi, Georgia, Florida

Minnesota, Wisconsin, Ohio, Michigan, Illinois, Indiana

People and Organizations

RESOURCES

General Information

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FEMA Region VII Public Information: Tim Seidel 911 Walnut Street, Room 300 Kansas City, Missouri 64106 (816) 374-5912 Nebraska, Iowa, Missouri, Kansas

FEMA Region VIII Public Information: Marvin Davis Denver Federal Center, Bldg. 710 Box 25267 Denver, Colorado 80225-0267 (303) 235-4900 Montana, North Dakota, South Dakota, Wyoming, Utah, Colorado

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Bothell, Washington 98021-9796
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Washington, Oregon, Idaho, Alaska





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RESOURCES

People and Organizations

General Information

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Marty Bishop Dade County Civil Defense 5600 S.W. 87th Avenue Miami, Florida 33173 (305) 596-8700

American Insurance Association 85 John Street New York, New York 10038 (212) 669-0400

Guy Daines
Pinellas County Dept. of Civil
Emergency Services
15250 Spadco Drive, Route 4
Clearwater, Florida 33520

Foremost Insurance Company 5800 Foremost Drive, S.E. P.O. Box 2450 Grand Rapids, Michigan 49501 (616) 942-3000

Insurance Information Institute Texas Subscriber Office Suite 3200 100 Interregional Highway Austin, Texas 78701 (512) 476-7025

University of North Carolina Sea Grant College Program Box 8605 Raleigh, North Carolina 27695 (919) 737-2454

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People and Organizations

RESOURCES

Gaining Private Support

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Mary Wiser Tampa Bay Regional Planning Council 9455 Koger Boulevard St. Petersburg, Florida 33702

Community/Regional Participation

Coastal Area Planning and Development Commission P.O. Box 1917 Brunswick, Georgia 31521 (912) 264-7363

Paul Connick, Director Jefferson Parish Civil Defense 1887 Ames Boulevard Marrero, Louisiana 70073 (504) 340-8671 Hawaii State Civil Defense 3949 Diamond Head Road Honolulu, Hawaii 96816 (808) 734-2161

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RESOURCES

People and Organizations

Broadcast Techniques

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Public Response

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Perspectives on Hurricane Preparedness

a monograph

Introduction

"We have a very serious hurricane problem . . . primarily a human one."

Dr. Neil Frank National Hurricane Center August 9, 1984

Experts estimate that 80 percent of the more than 40 million people who live in coastal areas along the Atlantic seaboard and the Gulf Coast have never experienced a major hurricane. Without adequate emergency planning, warning, mitigation, and public awareness programs, we could be headed toward a major hurricane disaster.

Public awareness activities are vital in fighting "hurricane-aware-less-ness" and in raising the level of citizen preparedness to deal with these violent storms. This monograph highlights the successful efforts of various state and local governments, and business and industry in innovative hurricane awareness/education programs. Stories focus on awareness techniques, public response, instructional programs, and private sector and community involvement in hurricane preparedness planning and awareness efforts that can be replicated or adapted by others.

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Using Broadcast Communication Techniques

When You Vacation . . . Take a Weather Forecaster Along

by
Robert M. Tibi
Meteorologist in Charge
National Weather Service Office
Parkersburg, West Virginia

Think how much better your vacation would be if you could plan your daily activities based on the latest weather forecast available. More important, think how much safer it would be if you had access to weather watches, warnings, and special weather advisories when severe conditions threaten.

National Weather Service warnings can be especially critical to people camping in mountainous areas prone to flash flooding, or to boaters who might be caught on the water when a severe thunderstorm moves across the area.

NOAA Weather Radio, "The Voice of the National Weather Service," is a service of the National Oceanic and Atmospheric Administration (NOAA) of the U.S. Department of Commerce, and provides continuous broadcasts of the latest weather information directly from local National Weather Service offices. It's a service that virtually allows travelers to take a weather forecaster with them wherever they go, to constantly advise them of weather conditions and to alert them of possible weather hazards on the horizon.

Most NOAA Weather Radio stations operate 24 hours daily, giving information tailored to the needs of people within the receiving area. For example, stations along the sea coasts and Great Lakes provide specialized weather information for boaters, fishermen, and others involved in marine activities, as well as the usual airing of general weather information.

The stations repeat taped weather messages every four to six minutes, revising the information every one to three hours, or more frequently as needed.

During spells of severe weather, National Weather Service personnel can interrupt the routine weather broadcast and substitute special warning messages. They can also activate specially designed warning receivers.

These warning receivers either sound an alarm indicating that an emergency exists or, when operated in a muted mode, are automatically turned on so the warning message is heard. This can be especially useful to travelers who have not had the opportunity to hear a local forecast.

NOAA Weather Radio broadcasts are made on one of seven high-band FM frequencies from 162.55 megahertz (MHz)-frequencies not found on the average home or automobile radio now in use. However, a number of radio manufacturers offer special weather radios to operate on these frequencies, with or without the emergency warning alarm. These radios are relatively inexpensive, ranging in price from \$20 to \$50. Also, there are now many radios on the market that offer

standard AM/FM frequencies plus the "weather band" as an added feature.

The National Weather Service operates over 370 stations, making up-to-date weather information available to approximately 90 percent of the nation within listening range (approximately a 40-mile radius of the transmitter) of a NOAA Weather Radio broadcast.

Contact your nearest National Weather Service office for more information on NOAA Weather Radio, or write to National Weather Service, National Oceanic and Atmospheric Administration, Silver Spring, MD 20910.

NOAA Weather Radio could enhance your vacation and possibly save your life during severe weather. So why don't you take a weather forecaster along when you travel this year?

Using Weather Information For Emergency Management in a Small Coastal Community

by Jerry D. Hill Emergency Management Coordinator Taylor Lake Village, TX

Emergency management coordinators in small coastal communities where hurricanes are an annual threat may wish to consider some new and innovative sources of weather information this year. When a storm is threatening, there can be no substitute for timely, detailed information from the National Weather Service (NWS). Now, some alternatives are available for obtaining this information.

As a hurricane approaches land, weather radars are extremely valuable--not only for tracking the eye of the storm but also for showing the bands of heavy rain and squalls. Direct connection to the NWS radar can be made in an Emergency Operations Center (EOC), but these hook-ups are expensive and require some type of permanent arrangement. An alternative source of weather radar information is now available on many community cable television systems. These systems usually allocate one of the channels to show the display from the NWS radar; often the NOAA weather radio broadcast is placed on the audio portion. Sometimes, the franchisee in a community is willing to install a gratuitous drop in the local EOC for use when a storm emergency exists.

When NWS issues its regular advisories, it is often desirable to have a printed copy of the full text, including the new probability data. Also, the marine advisory—with data on the radius of gale force winds, wave heights, and the forecast storm track—is valuable. However, much of this information is presented in summary form by NOAA Weather Radio. The full text can be obtained only if a teleprinter and appropriate communications

circuits are available. The limited seasonal use of such equipment sometimes makes it difficult to justify installation in a small community where financial resources are limited.

Many small municipalities use microcomputers that can be used to access this information during the hurricane season. Since most of these computers are portable, it is easy to move one to the EOC when a hurricane develops.

The private vendors of the weather information obtain the advisories upon release by NWS and have them available for display or print-out for your use. Acquiring information in this way is dependent on having telephone service and power, but these services are usually reliable in the period when a storm is approaching and important evacuation decisions must be made.

In addition to having the current hurricane advisories, data vendors offer a selection of other weather information. This includes hourly weather reports from airport stations giving wind direction, wind speed, rainfall intensities, accumulated rainfall, and other valuable information.

The cost of hurricane advisories and other weather information via computer is usually nominal because hardware is already available for use in most communities. Typically, you can expect to spend about \$100 on data for a particular storm unless it stays for an unusual number of days.

The second secon

For more information about these weather data vendors and services available, ask your local National Weather Service contact for a list of companies.

New computer software programs are available that use the storm coordinates

to compute the direction of movement and forward speed of a storm in addition to displaying a map showing its track. Most computer software catalogs list sources of these programs.

EBS/PIES Communications System Goes on the Air in Texas

When Hurricane Alicia hit the Texas coast on August 18, 1983, the community of Baytown was among the hardest hit. Located in the storm's path 45 miles northwest of Galveston on Galveston Bay, more than 500 Baytown homes were flooded and 100 people had to be rescued from the rising waters. Miraculously, no one in the city of 60,000 was killed or even injured. Ask Baytown Emergency Management and Preparedness Coordinator Fletcher Hickerson what saved Baytown and he will answer you with two words: Luck, and PIES.

The Public Information Emergency System (PIES) is a new radio communications network that is now operational and being expanded in the Houston/Galveston area. PIES is the first such disaster network of its kind in the entire country, and has so

impressed the Federal Communications Commission that it could become a model for other cities nationwide and along the Gulf Coast.

The system uses a special radio frequency (161.64 MHz) to link all of the participating Emergency Operations Centers (EOCs) in Houston's 41 suburban cities with the more than 60 media outlets (radio, TV, newspaper, wire services, etc.) in the metropolitan area. PIES receivers have already been installed at most of these media outlets, and transmitters have been operational in the Houston/Harris County and Baytown EOCs since 1982.

The system proved to be crucial when Baytown's local radio station lost its tower in 100 mph winds around 2 A.M. on the day Hurricane Alicia hit. A Houston radio

station picked up the information Hickerson was broadcasting on PIES and relayed it back to Baytown residents.

Instant information proved to be the key in surviving Alicia, because the storm kept changing. As Hickerson got new information from the National Weather Service, he broadcast it over PIES, along with the latest tide and wind readings.

"In spite of everything, we had people caught by the waters. We came through because of the good information we were able to get out. No one was even injured-because we had PIES, in our opinion," Hickerson said.

Since Alicia, the PIES network has been expanding in Texas. When completed, broadcast band two-way radios will be installed in each of the Emergency Operations Centers in the five-county Houston metropolitan area, so that mayors, county judges, and civil defense officials will have direct radio contact to primary and secondary Emergency Broadcast System (EBS) stations, as well as other news media outlets.

During an area disaster such as a hurricane, Houston's primary and secondary EBS stations act as EBS/PIES Net Control Stations, coordinating a series of "round robin" city-by-city, county-by-county reports, with break-in capability for any emergency update. With these reports coming directly from each city or county EOC, the information should be more reliable, timely, and would be shared equally with all the news media, which could disseminate the same accurate information to the public. This would minimize the possibilities of being misquoted, sensationalized, or in conflict with other reports. If a mistake is made, the EBS/ PIES would allow faster correction to all news outlets.

Instead of trying to communicate by telephone lines (which often become busy or go dead because of high winds, flooding or overloaded phone circuits), each city and county EOC would communicate by radio on the same frequency. This means they would also be able to communicate with each other and coordinate their activities. They would be aware of a nearby town's evacuation, for example, that could cause traffic problems for them.

John Caswell, Emergency Coordinator for the City of Houston and Harris County, calls PIES "the most valuable asset enabling us to get information to the public more expediently during a disaster." It was Caswell who pioneered the idea in 1979, when he purchased monitors for media outlets in the Houston area.

Not long after the Houston system became operational, Chuck Wolf, news director for KIKK Radio-Houston, became interested in expanding PIES areawide and took the lead in developing the Houston Area Emergency Broadcast System/PIES Plan, which has been approved by the Federal Communications Commission. Wolf reports that the FCC is very interested in expanding the system to other areas of the country. He believes the EBS/PIES could be an asset in many major metropolitan areas where there are a large number of media outlets. "With PIES, one message goes out to everybody at the same time, and everyone gets reliable information," he said.

For more information on the EBS/PIES, technical specifications, costs, and licensing procedures, contact Chuck Wolf at KIKK Radio-Houston, (713) 981-9600.

Developed by the Federal Emergency Management Agency with the cooperation of KIKK Radio-Houston, Baytown Emergency Management and Houston/Harris County Civil Defense.

Instructional Programs to Encourage Family Involvement

Teaching Preparedness: "Before the Hurricane Strikes"

The past 30 years have been marked by a demographic shift that has moved millions of people into coastal zones vulnerable to hurricane winds and floods. Many of these new coastal residents bring with them little or no experience or knowledge of the destructive potential of hurricanes.

John Sanders of Sanders Scientific Enterprises in Marina, California, has developed an approach to improving public awareness of the hurricane hazard based on fundamentals of how people learn and remember. While with the University of North Carolina Sea Grant College Program, Sanders put together an instructional package for schools. The kit, entitled "Before the Hurricane Strikes," includes an 18-minute videotape and a teacher's guide with selected hurricane readings and suggestions for a variety of educational activities and exercises.

In developing the educational program in North Carolina, Sanders considered the following features to be important:

- Simplicity: Any material developed for the public should be easy to comprehend and apply.
- Learning about the physical processes of the hurricane should take place.
- People should become familiar with appropriate preparedness measures.
- People should be able to retain and recall this knowledge with accuracy at a later time.

A hurricane safety checklist was devised to aid students in developing their own family hurricane preparedness plan. The checklist, which is in the form of a "dichotomous key," requires each student to make two yes/no decisions. When this is completed, the student is guided into a planning process. Each planning phase begins with a statement outlining the potential risk that the student and his family might face if a hurricane threatens. The student then uses the checklist as a guide in preparing a family hurricane preparedness plan.

The concept of the checklist and family plan was initially tested with 40 eighthgrade members of the Pamlico Junior High School Science Club in Bayboro, North Carolina, during the 1982-83 school year. To complete the exercise, students consulted with parents, teachers, and local officials, including the County Emergency Management Coordinator and the Soil Conservation Officer. Thirty-seven of the students traveled to Raleigh and slept on cots at Wake County Red Cross Headquarters, as they would if a hurricane forced evacuation of Pamlico County. The trip was the subject of several stories in newspapers and on television and radio. One cable TV station later produced a special based on the project, while the state's largest newspaper used it as a lead for a story on hurricane preparedness.

Dick Simmons was director of Pamlico County Emergency Management when the junior high school undertook the hurricane project. "So many people in rural areas like Pamlico County say, 'we're not going to get hit.' But when their kids come

home with knowledge about wind speeds and tide surge, they begin to realize what they need to do," he said. Simmons participated in a workshop with the students on County hurricane evacuation plans. In fact, as a result of working with Sanders and the Pamlico Junior High School project, he decided to revise the county's hurricane evacuation plan because it left unclear the point at which evacuation would be ordered.

While completing the hurricane safety checklist is a relatively simple task, the exercise is valuable because the students not only take a look at the checklist, but also involve their parents in the process. "One student learned for the first time that his grandparents' house had been destroyed during the 1933 hurricane and his father was carried from the house on his bed by the storm-induced tide," Sanders said. "These things had never been discussed until the son brought home the assignment to complete the family hurricane preparedness plan."

Sanders observed that bringing families into the discussion has an additional benefit. "People with pre-existing notions of how they would deal with a hurricane respond more effectively when a hurricane hits," he said.

Through his research, Sanders has found that parents will take the time to answer a child's questions about the checklist and to help make decisions about important elements of the family hurricane preparedness plan. "About 80 percent of the students who take home the assignment complete the plan with the help of their parents," Sanders indicated.

The core of the educational package is an 18-minute videotape that uses newsreel footage and interviews with an emergency official and a survivor of Hurricane Hazel in 1954 to illustrate the destructive force of a hurricane and to put the devastation in human terms. The kit, which also includes the teacher's guide, is available for purchase or rental from the Educational Media Center, 2318 D.H. Hill Library, North Carolina State University, Raleigh, North Carolina 27650.

Developed by the Federal Emergency Management Agency with the cooperation of John Sanders, Sanders Scientific Enterprises, Marina, California.

Educational Program Encourages Students to Seek Hurricane Precautions

A rate of growth equal to about seven times the national average has resulted in "hurricane-aware-less-ness" for 80 percent of South Florida's population. This growth rate, with the burgeoning of capital developments along South Florida's hurricanevulnerable coasts and past coastal mismanagement practices, has stimulated the development of a two-phase instructional model designed to create an awareness of the area's hurricane problem. The model--identified by the acronym CALM, for Cognitive and Affective Learning Model--has been developed by meteorologist Howard A. Friedman of the National Oceanic and Atmospheric Administration's Atlantic Oceanographic and Meteorological Laboratory Hurricane Research Division, where it is undergoing proof-of-concept testing.

Improvement of the public's ability to respond to a call for action to survive a

landfalling hurricane is but one objective of the program. Increased hurricane awareness is expected to encourage an informed citizenry to participate in certain precautionary local, state, and national governmental processes. Such processes, for example, would be limiting the development of coastal and ecologically sensitive storm-vulnerable areas; strict enforcement of building codes, zoning, and setback requirements; and the provision of local facilities for disaster prevention and public safety.

The cognitive phase of the CALM model uses a simple computer-assisted instructional technique to guide each student through a series of learning units about hurricanes as a geophysical phenomenon, and about precautionary public policies that can be adopted to mitigate the effects of future storms. However, the self-paced program can be easily adapted for use without a computer.

Friedman uses actual newspaper editorials, news stories, and radio and TV tapes that trace the efforts of groups of local citizens who are fighting to limit development of storm-vulnerable areas. This "current events" material illustrates steps that can be taken to protect areas from hurricane-associated dangers before the threat is imminent.

Once students demonstrate mastery of the material in the cognitive phase of the instructional model, they are ready to progress to the affective phase, which explores the dynamics of the social and political processes at work when a community faces the prospect of a landfalling hurricane. Here, students assume the roles of some of the main actors in such a drama: the mayor; emergency management coordinator; police chief; a business leader or hotel/tourism industry representative; and a member of the media, to name a few.

During the simulation, they are presented with a realistic hurricane scenario and asked to react according to their perception of how the person whose role they are playing would act, given the information at hand. After the exercise, a teacher helps students process the information they have gleaned through participation in the simulation. Friedman says that one common misconception can be cleared up right away: "Students generally think that once a storm is detected, people first begin to make plans. Most students are unaware of the longrange planning that precedes the hurricane season, and that hurricane plans are already in place," Friedman explains.

The CALM model is intended for use primarily with students in secondary schools and above, and not just in science

classes. Friedman explains that the CALM model looks at the hurricane from a number of different perspectives. A social studies teacher could use the program as a bridge to demonstrate how local disaster preparedness decisions are made, or to explore interrelationships between local, State, and Federal governments. An English teacher could use the same exercise to look at the role of the journalist, and to fashion strategies for effective communications. A psychology class might focus on how people react in a crisis and discuss how they can be encouraged to take a threat seriously, and to take appropriate actions without panicking. And finally, the science teacher could use this geophysical event--a hurricane--as a window on science, mathematics, and technology.

While the material is written for use in South Florida communities, local information could be substituted for use in other areas. If proven to be an effective teaching tool, Friedman said the CALM model may eventually be adapted for use in awareness programs for other natural and manmade hazards. Right now, the program is still being tested by NOAA, and Friedman is working on a guidebook to accompany the instructional package.

"We want to enhance not only awareness, but we want students to think about things and participate in decisionmaking processes that can have a real impact on their routine way of life," Friedman said. The idea is that students will bring home new information about the hurricane danger and, with their parents, develop their own family hurricane action plans. That concept is central, Friedman says, because research in the behavioral and social sciences indicates that people are more likely to follow decisions they help to formulate.

Developed by the Federal Emergency Management Agency with the cooperation of the National Oceanic and Atmospheric Administration's Atlantic Oceanographic and Meteorological Laboratory Hurricane Research Laboratory.

Getting and Using Private Industry and Volunteer Support

Elevation Markers Remind Residents of Hurricane Danger

Residents of Key West, Florida, are reminded daily of how vulnerable to hurricanes their neighborhoods are, thanks to a simple, inexpensive, and effective awareness tool developed by the Key West Planning and Restoration Commission. Using data collected for a sewer project, the city stenciled highly visible elevation markers on utility poles at about 90 intersections throughout Key West. The markers show the elevation in feet above mean sea level in the eye of the standard hurricane symbol.

"By making people aware of how low their neighborhoods are, they know that in a hurricane they may have to relocate into the center of town, if not out of the county," explained Janice Drewing of Monroe County Civil Defense. Drewing coordinated the project a little over two years ago, when she was Key West's city planner. "I thought it was an important thing to do, especially because some areas of town are extremely low, just four feet above mean sea level," Drewing said.

The cost of the project was minimal because elevations had already been shot for a sewer project, and because Drewing was able to enlist the help of an engineer with Sea Grant funding at the University of Florida. He verified the elevations and prepared a map. The 478th Civil Affairs Company, U.S. Army, did the actual stenciling of the markers on utility poles.

Key West and Monroe County Civil Defense use the markers as a focal point in hurricane awareness campaigns. For instance, at the beginning of each

hurricane season, they place a newspaper article cautioning residents about the hurricane threat and alerting them to the elevations posted throughout the city. It is one way to get people thinking about what they need to do when a hurricane strikes.

"It's an excellent tool," Drewing said. "People see the markers every day, so they are constantly reminded of the hurricane danger."

Developed by the Federal Emergency Management Agency with the cooperation of Janice Drewing, Monroe County Civil Defense, Key West, Florida.

Local Businesses Underwrite Awareness Effort

When the Board of Commissioners turned down a request for \$3,900 to print 77,500 evacuation maps for Charlotte County (Florida), Disaster Preparedness Coordinator John Derr had to look elsewhere for support. He did, and the project ended up costing the county absolutely nothing.

Derr knocked on a lot of doors and eventually found 20 Punta Gorda businesses willing to invest between \$50 and \$500 in exchange for advertising space in two corners of the attractive four-color maps. "We thought it would be a good community service project," explains Don Witter, president of First Federal Savings and Loan. The bank contributed \$500 to print 10,000 maps bearing its logo, and makes them available to patrons in each of its four branches. "Hurricanes are something everyone thinks about here, and a real concern every June through September," Witter said. He added that supporting the map project has made bank employees more aware of the hurricane danger. "We like to track the storms that may become a threat," he said. One side of the IIxI4-inch map provides a grid for plotting movement along the Atlantic Coast.

The Office of Disaster Preparedness uses elevation maps supplied by the Southwest Florida Regional Planning Commission that utilize SLOSH (Sea, Lake, and Overland Surge from Hurricanes) data to identify vulnerable areas in the event of storms of various intensities. Major roads and local landmarks are added to the maps by an artist paid by the County, as are the locations of evacuee staging areas and Red Cross operated shelters. This year, even the artist's fee was paid for with advertising revenues.

Each participating business agrees to print a certain number of maps with only its own advertising on them. The 20 sponsoring businesses this year agreed to print between 500 and 10,000 maps each, for the total of 77,500--enough to supply each Punta Gorda household with a copy for each of the next two years. After that, the Office of Disaster Preparedness will update data and begin another reprinting campaign.

The maps are distributed by participating businesses and are also available in public buildings and libraries. The local Chamber of Commerce lends support to the project by mailing out maps to its 1,000 members.

Developed by the Federal Emergency Management Agency with the cooperation of Charlotte County Disaster Preparedness, Florida.

Public Information Plan Key in Utility's Response to Hurricane Alicia

It was Monday, August 15, when Alicia--the first named tropical storm of the 1983 Atlantic hurricane season-formed in the north-central Gulf of Mexico.

"It's kind of like a gorilla with a machine gun. It goes where it wants to," said the meteorologist in charge of the weather service for the Houston area.

The slow-moving Alicia finally made up its mind and came ashore about 3 a.m., Thursday, August 18, at San Luis Pass, with winds of up to 135 mph. It proceeded northward on a path of destruction that left approximately three-quarters of a million Houston Lighting & Power (HL&P) customers without power.

When the fury of Alicia had passed, it was painfully obvious that the hurricane had caused the greatest damage to HL&P's electric system in the company's 102-year history.

Seven hundred and fifty thousand customers lost electrical service--more than the total number of customers HL&P had when Hurricane Carla struck in 1961. All power to Galveston Island was lost. Six hundred miles of line--the distance between Houston and Birmingham--were blown to the ground.

Service was restored to over 80 percent of customers within four days, and to all affected customers in 16 days.

Maintaining the flow of information to customers, federal, state, and city officials was a major responsibility. The company provided daily updates of restoration progress to the Public Utility Commission of Texas and the mayor of Houston. Company officials also contacted the Department of Energy's Office of Energy Emergency Operations in Washington the day after Alicia struck to apprise them of the status of HL&P's system. Public Affairs personnel worked

around the clock making sure that critical information was made available to news media as it came into the company's Emergency Evaluation Center.

Public Affairs' storm preparations is renewed at the start of hurricane season each year by updating large wall maps in the media center and by installing storm phones with direct lines to service centers. Communications to news media were distributed by Western Union TWX as well as by telephone and direct delivery. Special storm telephone numbers were also given to news media outlets at the onset of the storm. As a result, communication was never a problem.

Besides providing damage and repair updates throughout the days and nights before and after the storm, Public Affairs worked to make sure that particularly important messages got priority. All news media, particularly radio stations, gave excellent cooperation in relaying current information out to customers.

For example, a serious safety concern for linemen and customers from portable generators was publicized. If these machines are wired directly into a home's electrical system, current can flow back through the HL&P wires, with transformers boosting the voltage to dangerous levels. Effective communication was needed to warn customers of this hazard.

Public Affairs personnel also assisted news media representatives in providing information on downed wires. Passengers who found themselves in cars with lines down on them were advised on how to leave the vehicle safely.

Customers trimming trees were advised to stay clear of power lines. In recently restored areas, customers were reminded not to drop trimmed limbs on power lines lest the service be lost again. One newspaper declined to name an individual who accidently caused his subdivision to lose power in this way due to fear for his personal safety if his neighbors found out.

News media interviews were also arranged with work crews and company officials. Rumors were quelled and questions were answered. Frauds were reported. For example, as tree trimming crews worked through a neighborhood, a man went ahead of the crews to collect a fee for their services. With news media help, customers were quickly advised that the company was seeking no fees and that the police should be notified if someone sought to collect for HL&P's tree trimming work.

Over 500 calls were received from news media outlets seeking information—some from as far away as England—and a large number of calls were initiated to local news media. Thirty—nine storm damage and restoration progress reports were distributed by the department during storm repair efforts.

Excerpted from "The Alicia Story: How Houston Lighting & Power Company responded to Hurricane Alicia," August 1983, by Houston Lighting & Power. Used by permission.

Red Cross and Union Partnership: Local Unions Assist in Coastline Disaster Project

by W. M. Lawbaugh Editor, The Ironworker

Hurricanes . . . a fire . . . flooding . . . earthquake . . . explosions . . . a tornado. For more than a century, whenever disaster strikes, we have counted on the American Red Cross to come into the stricken area to coordinate evacuation, emergency health care, and temporary housing and food, and to mobilize community and volunteer relief services.

Typically, during a major disaster, the American Red Cross can send in 200 to 500 paid staff and volunteers to set up and coordinate emergency services. But if we depend so much on the Red Cross in a disaster, who can the Red Cross depend on to make their vital disaster services easier and more efficient?

Human lives and property are in the balance during a disaster. In the past, the American Red Cross would dispatch those 200 to 500 experts to a disaster area with nowhere specific to go. First, they would have to find a place for crisis Often such administrative control. facilities would have to be repaired on the Then emergency vehicles and equipment would have to be located and moved in, including generators if the power were out. Finally, a reliable communication system would have to be installed, including telephones (and now satellite systems), to receive and place calls for more help to specific stricken areas.

All this set-up and coordination could take several days, even a week. Precious time is lost as the disaster claims more lives and property which could have been saved if the Red Cross could have hit the disaster scene running.

However, in some Gulf and Atlantic regions, local trade union halls are now ready to serve as administrative disaster headquarters, thanks to a remarkable partnership between organized labor and the American Red Cross. The story of this partnership has been called "the best project the labor movement has ever been involved in" and yet another example of the community-minded spirit of union members who often are either volunteers in Red Cross rescue and emergency efforts, or, sadly, victims of a hurricane, tornado, flood, or fire.

"We hope this union hall is never to be used as a Red Cross emergency center," says one local union official, "but if disaster strikes, we're ready."

Fifty local unions are now equipped and ready to turn their hall keys over to the American Red Cross with a minute's notice, from Lake Charles, Louisiana, to Norfolk, Virginia--more than 2,000 miles of coastline.

Now, when disaster strikes anywhere along the Gulf or South Atlantic Coasts, the American Red Cross has a place to go, with the Coastline Disaster Project. In the halls, telephones drop from the ceilings; there may be an emergency generator out back; and plenty of room for parking and emergency work. Instead of several days for mobilization and set-up, these facilities are ready for emergency operation in less than half a day. This unique partnership between organized

labor and the American Red Cross did not just spring up overnight or automatically. The story actually begins during Hurricane Frederick, September 1979, in Mobile, Alabama.

Death, destruction, injury, and homelessness surrounded the scene as the Red Cross scrounged around Mobile for an administrative center to coordinate emergency services. They had to find a shelter, telephones, and a generator before staff and volunteers had something they could call a headquarters. It was the same story 78 years ago when an earthquake and fires killed 600 people and leveled 30,000 buildings in San Francisco. Ditto a few years later when a hurricane whipped through Tampa. Ditto virtually every year since: when disaster strikes, the American Red Cross often has nowhere to go to set up an emergency administrative headquarters.

In Mobile, Chuck Johnson got to thinking: Can we ever be ready to go during a disaster? Johnson is Director of Labor Participation for Regions 3 and 4 of the Eastern Operation Headquarters of the American Red Cross and National AFL-CIO Community Services Liaison. Boy Scout motto ate away in Johnson's mind over and over until 1981, the centennial anniversary year for both the AFL-CIO and the American Red Cross. Then he met with Ralph Barlow, disaster director for the Red Cross in the Southeast, and outlined a plan whereby local union halls would be retrofitted and equipped to serve as emergency administrative headquarters all up and down the Atlantic and Gulf.

Barlow, now deceased, was enthused by the idea--Coastline Disaster Project--and immediately Johnson began contacting state federations and central labor councils for the best locations of union meeting halls for prospective Red Cross disaster relief centers. In spite of recession, declining membership, and tight finances, without exception the response generous, organized labor was cooperative, and enthusiastic. After all, union members, as volunteers or victims in the past, knew and appreciated the American Red Cross.

The local union halls selected had to be on high ground but near an airport and motels. Some had to be pre-wired, altered, and equipped with emergency telephones and diesel emergency generators. Generators and communications equipment were donated by Southern Bell, South Central Bell, General Telephone of Florida, United Telephone Service, and Chesapeake and Potomac Telephone. Installing and retrofitting, as well as building insulated sheds for the generators, were performed by volunteer union construction workers.

The 50 local unions involved agreed to turn their meeting halls over to the American Red Cross during a disaster, often lasting up to two months until the emergency administrative headquarters is shut down. Unions so far involved in the Coastline Disaster Project are the IBEW Electrical Workers. Communications Workers, Steelworkers, Longshoremen, Tobacco Workers, Government Employees, Bricklayers, Carpenters, Plumbers, Operating Engineers, Auto Workers, Boilermakers, Textile Workers, Machinists, Paperworkers, and Ironworkers.

Cooperation continues between the Red Cross and strategic local unions to extend the Coastline Disaster Project from Texas to Maine, and eventually out west and inland. After all, similar Red Cross disaster relief centers are needed in Utah for mudslides, in Missouri for floods, and elsewhere for explosions, fires, tornadoes, earthquakes, and potential nuclear accidents. But with the hurricane season approaching, the Gulf and South Atlantic coastlines are better prepared as a result of this partnership between organized labor and the American Red Cross.

So far, in the two-year development of the Coastline Disaster Project, only three union halls have been used by the Red Cross, and one was in Jackson, Mississippi, last year during that region's second worst flood on record. The worst was in 1978, and the Red Cross had to scramble for several days to set up an administrative headquarters.

Last year, however, Red Cross officials flew into Jackson, drove to a CWA local union hall on high ground, cranked up the emergency generator, and dropped all the necessary telephones out of the ceiling tiles. In an unprecedented 30 minutes, the Red Cross had an emergency administrative headquarters from which staff and volunteers could begin mobilizing rescue efforts and coordinating all the thousand-and-one details of a disaster operation.

"Unless you've been through something like this," says Jackson Mayor Dale Danks, "you don't know how comforting it is to see people, maybe strangers from out of town, who care about you and your community." He applauds the unions, phone companies, and Red Cross for the Coastline Disaster Project.

So far, the value of the Coastline Disaster Project tops \$10 million in equipment, machinery, and manpower, every cent of it donated and voluntary. As such, the partnership strengthens the ties between the American Red Cross and AFL-CIO unions, but more importantly, the 50 retrofitted local union halls dotted all along the Gulf and Atlantic provide faster emergency services meeting human needs during a disaster.

Today, Chuck Johnson and Lucious Webb are running up and down the East Coast trying to get more local union halls retrofitted for emergency Red Cross use as the hurricane season approaches. Running interference for them, especially in right-to-work (for less) states, is E.T. "Al" Kehrer, southern director for the AFL-CIO Civil Rights Department. You'd be surprised to find pockets of resistance to what the Southern Field Office Advisory Council of Red Cross calls "a truly remarkable example of responsible citizenship on the part of organized labor" in the Coastline Disaster Project.

Nevertheless, while commercial media continue to hammer away at the AFL-CIO as a "special interest" of "labor bosses,"

Chuck Johnson finds nothing but cooperation and good will from state federations and central bodies of the AFL-CIO for the Coastline Disaster Project. The quiet, generous work of 50 local unions, until now, has gone unheralded, hardly noticed—but greatly appreciated by Jackson, Mississippi, and presumably wherever disaster strikes next.

Ironworkers Take the Lead in Coastline Project

Three Ironworker local unions were among the first to sign over their facilities to the American Red Cross for emergency headquarters under the Coastline Disaster Project.

In the event of a major disaster, Iron-worker halls in Savannah, Charleston, and Norfolk are ready to go for the coordination and administration of Red Cross disaster relief services. These halls were selected for their location in disaster-prone areas, convenience to airports, accessibility to lodging, and relative safety such as high ground during flooding.

Local 601 in North Charleston, South Carolina, was selected, for example, because of its location. The Coastline Disaster Project facility is not located in Myrtle Beach because it would be under water if a major hurricane hit.

Coastline Disaster Project coordinator Chuck Johnson first approaches the State AFL-CIO federation and then the appropriate AFL-CIO central labor council. In the case of Local 79 in Norfolk, Virginia shares a meeting hall with the central labor council on the highest hill around. During a flood, the local Red Cross chapter and the blood center would both be underwater.

Local 709 headquarters in Savannah, Georgia, is a back-up to the main Coast-line Disaster Project facility operated by the Boilermakers, which could suffer extensive damage during a severe disaster. In that case, Local 709 would become the

administrative disaster headquarters from which the Red Cross would operate.

"Ironworkers have been among my top supporters," Johnson said in an interview recently. His Coastline Disaster Project has been endorsed by top Red Cross and AFL-CIO officials who are now encouraging nationwide cooperation between the two organizations in order to expand the project to every major hit area in the nation.

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Leveraging Community/ Regional Participation

Hurricane Preparedness: "The Georgia Plan"

Nearly 350,000 people reside on or near the 112-mile stretch of Georgia coast-line--a coastline affected by one out of every seven hurricanes in the Atlantic region. In 1980, Georgia's Coastal Area Planning and Development Commission (CAPDC) began studying the needs of local governments in disaster preparedness planning. The study resulted in a model storm preparedness program that is both comprehensive and innovative.

What began as a prototype storm program funded under FEMA's Comprehensive Cooperative Agreement was continued through successful local initiatives. Federal funding totaled \$133,000 and was awarded to the CAPDC in 1981-82. Money to continue the project was obtained through a voluntary tax of 50 cents per capita in the 29 coastal and host counties involved.

The key to the success of "The Georgia Plan" is found in this introductory statement to the Storm Preparedness Guide developed by the CAPDC and published last April: "A storm preparedness program is more than just a set of documents containing response procedures. It is an ongoing, coordinated effort to prepare the general public for emergency situations. It is also an effort to prepare responsible public and private agencies and groups that direct, control, and support operations in emergency situations. In short, it is the difference between having a written plan and active planning."

Fully implemented in the coastal Georgia area by 1983, the program incorporates several critical elements: the intergovernmental coordination process guided development of the overall program followed by the development of major functional areas including planning, public education, and mapping.

Planning

A unique element of the plan is the designation and participation of inland or "host" counties. In addition to the six coastal counties designated as evacuation areas, 23 host counties participated in planning and preparedness efforts. Uniform plans were developed for reception and care of evacuees in host areas, with routes mapped, shelters identified, and emergency personnel designated for both response and recovery phases. Evacuation planning began with a telephone survey of households in the designated evacuation areas. Survey results indicated that the least likely residents to evacuate were those with the longest period of residency. Obviously, an effective public information/education program was needed, as well as a reliable network to inform residents of the dangers of "riding out" a storm.

Public Education

Public education efforts began with the identification of target audiences--local

government employees/officials, the elderly, school children, hotel/motel operators, and marina/boat operators. Then a series of formal action guidelines were prepared and distributed. Each guideline provides preparedness and safety information designed for a specific target group. An ongoing educational program, including seminars and other "hands-on" public contacts, was initiated and made an important part of the public information program.

CAPDC staff also worked with the local news media to ensure a uniform program of communication and warning for the general public. In cooperation with the National Weather Service, a five-phase condition/preparedness/response activity was put into operation. Beginning with "Condition 5," which identifies the development of a tropical storm disturbance, the public is made aware of the various stages of hurricane development. At "Condition 1" (a declaration that a hurricane will probably strike an area of the Georgia coast within 12 hours), a fullfledged emergency is declared and hurricane response plans are implemented.

Mapping

Perhaps the most time-consuming aspect of developing the storm preparedness program was the mapping procedure. Two types of maps were developed: Emergency Operation Center maps to be used by civil defense and other emergency managers and simple maps for use by the general public. Maps outlining evacuation routes, shelter locations, and other pertinent information were published in local phone books.

"The Georgia Plan" illustrates how regional planning agencies can be an effective mechanism to help groups and agencies coordinate their emergency preparedness planning efforts. The Georgia experience also shows how a little "creative financing" can go a long way at the local level.

Information about "The Georgia Plan" can be obtained from: The Coastal Area Planning and Development Commission, P.O. Box 1917, Brunswick, Georgia 31521.

Developed by the Federal Emergency Management Agency with the cooperation of the Coastal Area Planning and Development Commission, Brunswick, Georgia.

Improving Regional Cooperation: The Southeast Louisiana Hurricane Study

The Jefferson Parish Office of Civil Defense has put together a tabloid telling residents how to prepare for a hurricane, with help from the Louisiana Office of Emergency Preparedness (OEP), local elected officials, meteorologists from the National Weather Service, public utilities, and local businesses. Jefferson Parish's hurricane preparedness tabloid will eventually be adapted for use by eight other parishes in the New Orleans area that are part of the Southeast Louisiana Hurricane Study. It is one example of the resourcesharing and cooperation that have grown out of this two-year-old hurricane study and preparedness planning project, which involves the Louisiana OEP and the parishes (or counties) of Jefferson, St. Bernard, St. Charles, St. James, St. John the Baptist, St. Tammany, Lafourche, Plaquemines, and Orleans.

"Usually the state produces a massive report with hazard analysis on a broad scale, throws it at the parishes, and tells them to read it when they have a chance," explained Hurricane Study Program Manager Madhu Beriwal of the Louisiana OEP. This time, the individual parishes are working together with the state and with each other on virtually every aspect of a coordinated hurricane survival study and plan for the area.

The hurricane study relies on SLOSH (Sea, Lake, and Overland Surge from Hurricanes), a sophisticated computer simulation model available through the National Hurricane Center, to facilitate evacuation planning. The State OEP has provided the parishes with SLOSH data showing the rise and fall of surge levels and wind speeds for 12 different hurricane scenarios. The SLOSH model makes it possible to show tide surge differentials in minute detail and in areas as small as one-quarter square mile.

The parishes use the SLOSH data to develop evacuation zone maps and to

determine evacuation routes and time-frames for the 12 hurricane scenarios. Each parish also updates data on shelters and community facilities at risk, and identifies households requiring special assistance. To aid in evacuation planning, the State OEP coordinated a behavioral study with the parishes in which people responded to questionnaires about what they had done and would do during a hurricane.

Improving regional cooperation has been a special challenge in the New Orleans area effort, where the nine parishes involved are autonomous political jurisdictions, each with its own form of local government. Jefferson Parish Civil Defense Director Paul Connick says that the civil defense directors in a few of the parishes had met together to discuss common problems before the State OEP organized the Southeast Louisiana Hurricane Study, but that the study has broadened and solidified regional relationships. "We know each other and we know each other's politics," Connick explained.

All nine parishes in the area now participate in regular regional meetings and are working on a number of projects con-

nected with their overall goal of coordinating emergency response efforts and developing generic plans for all hazards. The group is negotiating with an airborne traffic monitoring company that provides daily traffic reports to radio stations. They are planning an aerial monitoring and reporting system with ties to the Emergency Broadcast System to aid traffic flow during evacuations. The nine parishes have also agreed in principle to work with the University of New Orleans on development of course materials on emergency management issues.

Because of their close economic and social ties, geographic situation, and mutual interests, the nine parishes present an ideal subject for a comprehensive emergency management project. August 1983, FEMA Region VI, the Louisiana Office of Emergency Preparedness, and the nine parishes agreed to build upon the foundation laid by their participation in the Southeast Hurricane Study. The hurricane study forms the nucleus of a project enlarged to include all hazards and a wider scope of activities, and is designed to use Integrated Emergency Management System (IEMS) concepts and methods to improve the region's overall emergency management systems.

Developed by the Federal Emergency Management Agency with the cooperation of the Louisiana Emergency Preparedness Association, Jefferson Parish Civil Defense, and the State of Louisiana Office of Emergency Preparedness.

Hawaii's Hurricane Week Campaign Spurs Interest in Preparedness

The Hawaii experience is another example of how it often takes a disaster before people start to think seriously about preparedness. When Hawaii State Civil Defense (SCD) offered awareness materials for its 1983 hurricane season campaign, public response trickled in. Then came Iwa, the most damaging hurricane ever to enter Hawaiian waters. Between November 19 and 25, 1982, Hurricane Iwa caused an estimated \$234 million damage to the Islands.

The storm also caused a surge of public interest in the hurricane hazard, reports Hawaii SCD Public Information Officer Marilyn Kali. The next time SCD promoted hurricane preparedness, there was an attentive audience for its message. Hawaii Hurricane Preparedness Week (July 17-23, 1983) was successful mainly because SCD sparked the interest active participation of officials, the private sector, news media, and Hawaii residents in a variety of activities designed to increase awareness and offer ideas for preparing for the next Pacific hurricane.

Sponsored jointly by state and county civil defense agencies and the National Weather Service (NWS), the campaign was kicked off by Governor George Ariyoshi, who signed the Hawaii Hurricane Preparedness Week proclamation and urged the public to become more aware of how to prepare for an eventual hurricane.

Kali pointed out that SCD had originally scheduled only one activity to mark 1983 Hurricane Preparedness Week--a Hurricane Conference sponsored by NWS, to which the general public was not invited. Instead, SCD decided to expand the scope of the week's events. "A proclamation

from the Governor declaring Hurricane Week is not a newsworthy event unless it can be built around activities that will include the public and the media," Kali explains.

To publicize the week, SCD prepared and distributed 80 press kits for the media, issued 25 press releases, 19 public service announcements (PSAs) for radio, and produced two PSAs for television with the Hawaiian Electric Company (HECO). As a result of the effort, newspapers provided a total of 1,601 column inches of publicity along with editorials in three major newspapers.

"Electronic media also generously supported the program, which is noteworthy because Hawaii Hurricane Preparedness Week was not 'hard news' but more in the line of a public service feature," Kali said in a summary of SCD's Hurricane Week Two of the three networks effort. attended a kick-off press conference and ran news features. Later in the week, each ran a feature story on the "Hurricane Guide" prepared by SCD. All three networks covered Governor Ariyoshi's tour of the NWS Forecast Office at Honolulu International Airport, where he received a personal briefing from the meteorologistin-charge.

Radio coverage included live and taped interviews with civil defense and NWS staff. Many radio stations also used the PSAs that SCD had provided.

Almost 500 people attended open houses and took tours of the state and Oahu Emergency Operating Centers and NWS forecasting offices. More than 1,200 people viewed a 20-minute slide show put together by SCD and shown in public

libraries and other locations throughout the state.

Perhaps the most dramatic measure of how much interest the hurricane preparedness campaign generated was in the public demand for more information on how to prepare themselves for a hurricane. SCD produced a special edition of its newsletter, <u>Civil Defense Report</u>, that included an eight-page insert, "Hurricane Guide for Hawaii Residents." Based on past demand for this type of publication, SCD decided to print and distribute 2,000 copies on a by-request basis. That wasn't nearly enough: at last count, Kali said, more than 30,000 copies of the Hurricane Guide had been distributed, and requests still come in.

Major retailers were invited to support Hawaii Hurricane Preparedness Week through special promotions. Foodland, Sears, Pay 'N Save, A. L. Kilgo, and Honsport purchased newspaper advertising during the week to advertise survival kits. Kilgo's radio advertising featured hurricane preparedness. The Army-Air Force Exchange Service set up special displays

of survival kits in all exchanges and distributed hurricane preparedness brochures.

At SCD's request, Foodland printed hurricane preparedness messages on grocery bags and distributed 960,000 of them during July.

HECO promoted Hawaii Hurricane Preparedness Week in its "Consumer Lines" insert and on electric bills. HECO also produced a brochure, "Setting Up Your Hurricane (and Power Outage) Survival Kit," and received 1,620 individual requests.

SCD also produced a brochure, "Hurricane Preparedness Information for Boaters," that was distributed by the State Harbors Division to all registered boat owners in the state, marinas, yacht clubs, and boat dealers. Total distribution was 20,000 copies. Survival kits were featured on a bus poster developed by SCD and printed by Oahu Civil Defense. The poster was displayed on 600 Oahu buses from July through October.

Developed by the Federal Emergency Management Agency with the cooperation of Hawaii State Civil Defense.

Measuring Public Response to Shape Your Program

Hurricane Watch . . . Hurricane Warning- - Why Don't People Listen?

Why do some people respond to hurricane warnings while others do not? What specific types of information are most conducive to timely response? These questions were the focal point of a research study completed in the spring of 1980 at Texas A&M University which tried to determine what motivates people to respond to hurricane warnings.

The researchers knew that many long-time residents have been conditioned to hurricane watches or warnings and no longer consider an approaching storm a threat to safety until it often is too late to respond appropriately. Many other residents are newcomers and have never experienced a hurricane.

Psychological experiments were conducted with residents of Galveston, Texas, an island 75 miles southeast of Houston that last experienced a major hurricane (Carla) in 1961. While some conclusions relate essentially to the

uniqueness of Galveston, all are applicable to any coastal area that could experience a hurricane.

The experiments were grouped into five subject areas:

- 1. Simulated hurricane variables;
- Consequences of exposure to hurricane fury via television;
- Influence of other residents, authority figures, and events;
- Response as a function of media presentation; and
- Response to fear, information, and testimony in current hurricane material.

Subjects were selected at random from the local telephone directory and were

Ed. Note: This article first appeared in 1980. Hurricane Alicia hit Galveston in August 1983.

either interviewed in their homes or participated in group experiments at Galveston Community College or Texas A&M University at Galveston.

Twenty variations of a simulated hurricane, Karen, were developed, and booklets containing 28 weather bulletins and advisories were prepared for each. Each bulletin or advisory was designed to measure the influence of one aspect of the storm--direction, movement speed, stationary status, wind speed, distance from Galveston, issuance of a watch,* issuance of a warning,** amount of anticipated storm surge, and an evacuation warning.

The study involved 381 people who were interviewed in their homes. For each bulletin or advisory, the subject was asked to choose a response ranging from "wait for further bulletins" to "evacuate immediately" and to indicate his or her perception of danger on a furnished scale.

Scoring was based on statistical probability. An item was considered statistically significant only if there was less than a five percent probability that the pattern of scores could have occurred by chance.

Only two items, distance from Galveston and evacuation warning, proved to be statistically significant. It should be noted that neither issuance of a "watch" nor a "warning" were statistically signifi-

cant. Those interviewed seemed unable to distinguish adequately between the two, even though definitions for each were given prior to the experiment.

It also may be significant that people do not differentiate between Force Two, Three, Four or Five type of hurricanes.* They tend to group everything beyond Force One into a single category; this could impair sound judgments and correct responses.

Consequences of Exposure to Hurricane Fury Via Television

The chief experiment in the second study involved 32 residents who were evenly divided into control and experimental groups. Each group heard six taperecorded items of hurricane information on a developing storm and was asked to indicate its responses. The experimental group then viewed a video tape of the most destructive scenes from several hurricane films, while the control group saw a film on other psychological experiments. All 32 again were asked to respond to six tape-recorded messages relating to a developing hurricane, and these responses were compared with the original six.

There were more than three times the number of increased positive responses among the group exposed to the hurricane fury videotape than among those who saw the other film. The probability that such a response pattern occurred by chance was less than one in 100. It can be concluded that a more positive response to hurricane information does occur after examples of hurricane fury are shown on television.

Influence of Other Residents, Authority Figures, and Events

Twenty-four people participated in the primary experiment in the third study, which was designed to determine the effect of outside influences on response. In one phase of the experiment, each

^{*}Watch--The first alert when a hurricane poses a possible, but as yet uncertain, threat to a certain coastal area. Small craft advisories are issued as part of a hurricane watch advisory.

^{**}Warning--Notice that within 24 hours or less a specified coastal area may be subject to (a) sustained winds of 74 mph or higher and/or (b) dangerously high water or a combination of dangerously high water and exceptionally high waves, even though expected winds may be less than hurricane force.

^{*}See definitions at end of article.

subject could see a master display panel and was told it indicated others' responses to hurricane information. Each individual was led to believe that others were making more or less extreme responses than his or her own. It was learned that the mere knowledge of others' actions was insufficient to influence response patterns significantly. At the same time, it was discovered that a statement from an authority figure, such as a National Weather Service spokesman, did have a significant positive effect on those with no prior hurricane experience. There was a less significant effect in this regard for persons with prior hurricane experience, but they were influenced more by surrounding events such as plant closings. This latter group probably was aware of the actions taken by surrounding industrial plants during previous storms, and the people focused on these events as an indication of the severity of the impending There was less than five hurricane. percent probability that these results could have occurred by chance.

Response as a Function of Media Presentation

The fourth study involved radio and television presentations viewed by 30 The chief finding Galveston residents. resulted from comparing two series of five specially prepared sequential television presentations that related to development of a simulated hurricane. The two series of presentations were identical, except that one used a point or dot to locate the hurricane on a map and the other used a saw-like satellite representation to locate The saw type normally is the storm. shaped like a circular-toothed saw blade, covers a broader area of the map, and indicates more clearly the extensiveness of the hurricane.

It was found that the saw-type video representation led to a more positive response pattern than the point or dot type because it indicates the magnitude of a hurricane more effectively. There was less than a three percent probability that this response pattern could have occurred by chance.

Response to Fear, Information, and Testimony in Current Hurricane Material

Fifty-two persons were divided into four groups of 13 to record their responses to six items of pre-recorded information that depicted a developing hurricane. Each group then received currently available hurricane-related material, such television and radio spots and programs, films, and printed material, and was asked to rate its responses to each. Each group's material emphasized a different element or theme. One group, for example, received material on the destructiveness of a hurricane which potentially would Another received testiproduce fear. monial-type material, such as an interview with a survivor, and the third was given information-oriented material. The fourth group's material represented a combination of the themes.

Following this, all 52 again responded to six items of hurricane information. It was found that the combination approach had the greatest influence on positive responses. The next most effective was fear. Information alone or testimony alone had little effect. There was less than a one percent probability that the resulting differences occurred by chance.

Conclusions

These studies indicate that certain things can be emphasized during hurricane awareness programs to increase responsiveness during actual threatening conditions.

- 1. People need to be told specifically what they should do during a watch and during a warning.
- 2. People should be informed of the differences in severe hurricanes; they tend to perceive all hurricanes beyond Force One as "bad."
- People need to be informed about the amount of tidal rise that will block evacuation. In Galveston, for example, only about one-fourth of

- those interviewed were aware of the small tidal rise needed to halt egress.
- 4. People should be told how long it takes to evacuate. Again in Galveston, nearly 30 percent of those interviewed believed the entire island could be evacuated within six hours while the most recent studies have indicated a minimum of 12 hours.

When a threatening condition exists, there are several emphases that can be made, particularly by the mass media, to enhance a warning message's ability to elicit maximum safety responses.

- When the position of a hurricane is indicated by television weathercasters, a saw-type satellite location indicator conveys the massiveness of the storm better than a point- or dot-type indication.
- Persons without hurricane experience are best motivated by respected authority figures, such as someone from the National Weather Service.
- To motivate persons with hurricane experience, emphasis should be placed on surrounding events, such as plant closings, which they use to confirm the severity of the hurricane.

- 4. Hurricane warnings and evacuation notices are more effective in stimulating safety responses when there is a combination of fear, information, and testimony themes in the media presentation.
- 5. Television exposure to the destructive consequences of previous hurricanes also helps stimulate maximum safety responses. This becomes particularly effective if the films are shown just before an evacuation notice is issued.
- 6. This study found that the distance of a hurricane from land and evacuation notices were most effective in stimulating safety response patterns. Consequently, the media should emphasize these in its hurricane messages.
- Media presentations should establish the connection between hurricanes and tornadoes. In Galveston, 72 percent of the residents indicated they feared hurricane-spawned tornadoes more than the hurricanes themselves.
- 8. Special efforts should be made to make advisories, bulletins, and local statements bilingual. In most areas, radio and television news presentations are only in English but many of the residents may be Spanish-speaking or Oriental.

Hurricane Categories*

Force One--Winds of 74 to 95 miles per hour. Damage primarily to shrubbery, trees, foliage, unanchored mobile homes, and, possibly, poorly constructed signs. OR--Storm surge four to five feet above normal. Low-lying coastal roads inundated, minor pier damage, some small craft in exposed anchorages torn from moorings.

Force Two--Winds of 96 to 110 miles per hour. Considerable damage to shrubbery and tree foliage, some trees blown down. Major damage to exposed mobile homes and poorly constructed signs. Some damage to roofs, windows, and doors. No major damage to buildings. OR--Storm surge six to eight feet above normal. Coastal roads and low-lying escape routes cut by rising water two to four hours before arrival of hurricane center. Considerable damage to piers. Marinas flooded and small craft in unprotected anchorages torn from moorings. Evacuation of some shoreline residences and lowlying island areas required.

Force Three--Winds of 111 to 130 miles per hour. Foliage torn from trees, large trees blown down. Practically all poorly constructed signs blown down and mobile homes destroyed. Some damage to roofs, windows, and doors and some structural damage to small buildings. OR--Storm surge nine to 12 feet above normal. Serious flooding at coast and many smaller structures near coast destroyed. Larger structures battered by waves and floating debris. Low-lying escape routes cut by rising water three to five hours before hurricane center arrives. Flat terrain five

feet or less above sea level flooded eight miles inland or more. Evacuation of lowlying residences within several blocks of shoreline possibly required.

Force Four--Winds of 131 to 155 miles per hour. Shrubs and trees blown down, all signs down. Extensive damage to roofs, windows, and doors. Complete destruction of mobile homes. OR--Storm surge 13 to 18 feet above normal. Flat terrain 10 feet or less above sea level flooded as far as six miles inland. Major damage to lower floors of structures near shore due to flooding and battering by waves and floating debris. Low-lying escape routes cut by rising water three to five hours before hurricane center arrives. Major erosion of beaches. Massive evacuation of all residences within 500 yards of shore possibly required, and of single-story residences on low ground within two miles of shore.

Force Five--Winds greater than 155 miles per hour. Shrubs and trees blown down, all signs down and complete destruction of mobile homes. Extensive shattering of glass in windows and doors and complete failure of roofs on many residences and industrial buildings. Small buildings overturned or blown away. OR--Storm surge greater than 18 feet above normal. Major damage to lower floors of all structures less than 15 feet above sea level within 500 yards of shore. Low-lying escape routes cut off by rising water three to five hours before hurricane center arrives. Massive evacuation of low-lying residential areas within five to 10 miles of shore possibly required.

This is a summary of Sea Grant report TAMU-SG-80-202 entitled "Hurricane Message Enhancement." The full technical report is available for \$5.00 from Marine Information Service, Sea Grant College Program, Texas A&M University, College Station, Texas 77843. Reprinted from Marine Advisory Bulletin, May 1980.

^{*}Developed by Herbert Saffir, Dade County, Florida, consulting engineer, and Dr. Robert H. Simpson, former National Hurricane Center director.

Public Response in Hurricane Alicia: Probabilities and the People of Galveston

by
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At 5 p.m. CDT on Monday, August 15, 1983, the residents of Galveston, Texas, were told that Hurricane Alicia had a 17 percent chance of affecting their city within the next 72 hours or less and that hurricane warnings might be posted for the Texas coast on the following day. This marked the first time the public had ever been advised of the probability that a hurricane or tropical storm would strike their area. In the ensuing 60 hours before Hurricane Alicia eventually made landfall on Galveston Island, the public neither disregarded the threat due to "low" probabilities nor panicked. Public response to Alicia was pretty much the same as response has been to past hurricanes without probabilities. Evacuation from high-risk areas was extensive and timely, and the citizenry generally evacuated upon the advice of public officials or failed to do so in its absence.

Alicia did not, however, provide an acid test for public response to probabilities because the issuance of probabilities was discontinued before Alicia became a dangerous storm. The bulk of the population of Galveston was never told by public officials to evacuate, and when people were receiving probability messages, Alicia was not expected to be severe enough to pose a major threat to the safety of most Galveston residents.

Why Did People Evacuate?

Several weeks after Alicia struck Galveston, a telephone survey was conducted with approximately 200 randomly selected residents of the island.* Forty-four percent said they left their homes to go

someplace they believed to be safer, but of those who left their homes, almost 40 percent stayed on the Island. As in most hurricane evacuations, the plurality went to the homes of friends or relatives (47 percent in this case). Most of the evacuees said they left in part due to advice from friends and relatives, the National Weather Service, or the media. Only five percent specifically mentioned probabilities as being a reason for their decision.

*The Immediate Response Project is funded through the Natural Hazards Research and Applications Information Center, Institute of Behavioral Science, University of Colorado, Boulder, Colorado.

Why Did People Stay?

Those who stayed generally indicated that they did so because they felt safe where they were, or they wanted to stay behind to protect their property from the storm or looters. No one mentioned low probability values as a reason for staying. When asked directly, 87 percent of the total sample said they heard no advice from public officials that they should leave, but about half said they heard advice from unofficial sources such as friends.

Did People Hear or See the Probability Information?

Eighty-two percent of the respondents said they remembered hearing or seeing probabilities, and about 85 percent of those indicated that they saw or heard probabilities for other locations as well as Probabilities were discon-Galveston. tinued 20 hours before landfall of the storm and were never greater than 51 About 80 percent of the percent. respondents, though, recalled hearing probabilities "just before" or "a few hours before" landfall, and 42 percent remembered seeing probabilities higher than 60 percent. These apparent inconsistencies with the actual issuance of probabilities could result from use of imprecise terms ("just before"), memory lapses, recall of "old" probability information, or recall of erroneous information. Over 70 percent of the respondents correctly indicated that Galveston's probabilities were higher than at other places.

Where Did Probabilities Come From?

Almost 80 percent said they received their probability information from television, and 54 percent indicated hearing the numbers on radio. Seventy percent correctly believed that the probabilities were being issued by the National Weather Service, with the remainder simply not knowing or thinking the numbers came

from the media or private forecasters. Seventy-five percent felt the media presentations of the probabilities were clear, and another 20 percent felt they were pretty clear. Eighty-two percent said they personally understood the probabilities, and 15 percent said they understood them pretty well. Respondents had slightly less confidence in their friends' understandings, however.

Did Probabilities Affect Response Decisions?

Sixty-eight percent said the probabilities helped convince them that Alicia would hit their area; 15 percent said that initially the probabilities made them think the storm wouldn't hit, but later numbers changed their mind; and two percent said the probabilities made them think Alicia wouldn't hit. The remainder either said the odds figures had no effect on their belief one way or the other or they couldn't remember. Half the sample said they would pay greater attention to the numbers next time or place greater emphasis on them in deciding what to do. About half felt they would deal with the future probabilities in about the same way they had with Alicia's. Ninety-six percent said they believed probabilities are useful in response decisions, and only one percent felt they weren't; three percent weren't sure.

Overall, the public response to Alicia was very good, and there is no evidence that probabilities inhibited people from The high-risk areas of evacuating. Galveston Island were advised to evacuate when Alicia's chance of hitting was only 36 percent, and evacuation in those areas was almost total. Clearly, people believe they understood the probabilities and think that they were useful. This study, in conjuncton with previously existing evidence, indicates that the public can comprehend probability information in the form it was disseminated in Alicia and make reasonable use of it in their response decisions.

Using New Technology

Hurricane Surge Models: A Primer

As a hurricane approaches the shore, several factors combine to cause a rise in sea level which can produce severe inundation and great destruction. This is the "hurricane storm surge." The storm surge is a dome of water, perhaps 50 miles wide and from four to 18 feet high, that sweeps across the coast near the point where the hurricane makes landfall. The storm surge is responsible for perhaps as many as 90 to 95 percent of hurricane-related deaths.

Through modern technology in computer applications, historical hurricane surge information has been used to develop numerical surge models to calculate storm innundation. These models take into account the intensity of the storm and the unique topography of the bay, estuary, or coastline shelf to predict the storm surge at the most hurricane-prone sections of our coastline. Using these models, meteorologists and emergency planners can now estimate the storm surge at a specific coastal location by simulating the

approach of all possible sizes, intensities, and shapes of hurricanes along all relevant tracks and at all possible speeds. The simulations are also extremely valuable to emergency preparedness efforts, because the data allow planners to develop evacuation maps and plans in much greater detail than has ever been possible.

Three major surge models are used in the United States:

- SLOSH (Sea, Lake, and Overland Surge from Hurricanes), the newest model developed by the National Weather Service (NWS);
- SPLASH (Special Program to List the Amplitudes of Surges from Hurricanes), which is an earlier NWS model; and
- The FEMA Flood Insurance Storm Surge Model, used for the FEMA flood insurance program.

SLOSH

The SLOSH model is used in basins that have irregular coastlines and contain large bays or estuaries such as in the New Orleans area, Tampa Bay, and Galveston/Houston. Five storm intensities on the Saffir/Simpson Scale are provided by the SLOSH model. In addition to its intensity, any surge damage potential to a particular area depends on several other factors, including the track, size, and forward speed of the hurricane; and the nature of the area's coastline. Each hypothetical hurricane simulated by SLOSH would confront an area with hurricane force winds in one of five scenarios.

The output of the SLOSH model provides four major types of information on the effects of the simulated hurricanes. They are:

- (1) Surface envelope of highest surges above mean sea level;
- (2) <u>Time</u> histories of surges at selected gages or grid points;
- (3) Computed <u>windspeeds</u> at selected gages or grid points; and
- (4) Computed wind directions at selected gages or grid points.

SPLASH

To obtain open coast surge height data for a relatively smooth coastline, the numerical storm surge prediction model called SPLASH can be used. The SPLASH model predicts the height and duration of open coastline storm surge heights created by an approaching and landfalling hurricane. It assumes a generally smooth coastline and the absence of amplification of the surge by a bay or estuary. With the SPLASH model, inland routing techniques are used to delineate the innundation areas.

FEMA/FIA Model

A third storm surge model, the FEMA/FIA model used by FEMA's Federal Insurance Administration, calculates coastal flooding due to hurricanes. This is also a computer model, which uses the same types of equations as SLOSH and SPLASH to set coastal flood insurance rates under the National Flood Insurance Program. The FEMA model is used to calculate the 100-year storm elevation—a value of surge height that has a probability of occurring within 100 years at a given location.

Developed by the Federal Emergency Management Agency with cooperation from the National Weather Service.

Hazard Awareness Guidebook: Planning for What Comes Naturally

HAZARD AWARENESS GUIDEBOOK:

PLANNING FOR WHAT COMES NATURALLY

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TEXAS COASTAL AND MARINE COUNCIL Austin, Texas October 1979

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HAZARD AWARENESS GUIDEBOOK PLANNING FOR WHAT COMES NATURALLY

INTRODUCTION

Increased awareness of natural hazards on the part of our citizens is essential if property losses and human suffering from natural disasters are to be reduced. Many programs to raise hazard awareness have been initiated throughout the country with varying degrees of success. It is advantageous to review these experiences and recent research on public information raising programs. This Guidebook will help those who are currently involved in planning programs to improve the public awareness of threats from nature.

The Guidebook grows out of a national Hazard Awareness Workshop held in Corpus Christi, Texas, March 22 and 23, 1979. The goal of the sponsors of the Workshop, Texas Coastal and Marine Council and Natural Hazards Research and Applications Information Center. Boulder, Colorado*, was to provide a setting for exchange of information among those involved in communicating natural hazard information to the public. From this interchange of information, it was hoped to provide some guidelines for future awareness efforts concerned with earthquakes, hurricanes, floods, tornadoes, or the other natural hazards with which people must learn to cope.

It was obvious during the workshop that we do not have all the answers necessary to initiate, conduct, and evaluate awareness programs, but we can draw on a number of common experiences to produce an outline of elements which need to be considered when putting together a hazard information program. These elements are summarized in the following list of "dos". More complete lists of dos and don'ts are contained within the text.

"Dos" For A Hazard Awareness Program

Carefully define program aims. Whom do you want to reach? What message do you want to convey?

Start your program with simple goals and realistic expectations,

Find out what others have done or are doing in hazard awareness, both in your area and in the nation.

Make your message specific. Let it indicate what constructive action can be taken. Tailor it to your chosen audience.

Repeat and reinforce your message regularly.

Use different types of media to reach different au-

Use existing organizations or networks, both in gaining support for your program and in disseminating your message.

Choose the individuals or organizations most likely to have credibility with the target audience.

Use the best available natural hazards data, but have media and public information professionals simplify and adapt the information for public use.

Build in an evaluation of the program, however simple, from the beginning.

GETTING STARTED

Determining The Spark Which Ignites

Dos and Don'ts

- DO Look for a dynamic and concerned individual, in the private or public sector, who has the knowledge, drive, and connections to get an awareness program off the ground.
- DO Try to gain the support and involvement of all concerned parties early in the program formulation.
- DON'T Forget to check local, state or federal legislation which could give impetus to initiating an awareness program.

Who starts a hazard awareness program? Who should get involved in the initial planning efforts? Any individual or organization which identifies the need for such a program and can garner the necessary support provides the spark. The original push might come from the federal, state, or local government level, or from private business, civic organizations, or religious groups. Awareness programs have been initiated by groups as diverse as the Automobile Club of Southern California, Denver's Urban Drainage and Flood Control District, local museums and libraries, civil preparedness agencies (all levels), state or federal agencies concerned with particular hazards (United States Geological

Survey, National Weather Service, state Sea Grant programs), local colleges or universities, property insurance companies, and volunteer groups (from the Red Cross to local environmental groups).

Often the initial spark comes from a dynamic, concerned individual who is willing to devote time and energy to getting a hazard awareness program off the ground. This person or organization can sometimes gain support through legislation either already enacted or being considered at the federal or state level. For example, the National Flood Insurance Program has given some impetus to efforts to inform the public and their local officials about the program and flood preparedness efforts in general. Local interests can pick up on these information attempts and tailor them to their own communities. In California, hazard disclosure legislation has been passed requiring that a prospective purchaser of property be informed if that property is located in the area in which active surface faults have been identified. The existence of this legislation can be used to further public awareness of the earthquake hazard.

Sometimes, the legal question of liability for failure to notify those susceptible to different hazards can be the very spark with which to initiate an awareness program. Try to find a sympathetic, concerned legislator or local governing official to lend aid in initiating the awareness program.

Look around for other groups which might have an interest in a public information program and may have more resources than you. Inform other groups of your proposed education efforts and these groups, in turn, could provide support and ignite further interest. The Natural Hazards

^{*}Assistance in funding and conducting the Workshop were also provided by the National Oceanic and Atmospheric Administration and Texas A&M University, Sea Grant Program.

Research and Application Information Center in Boulder serves as a clearinghouse for hazard-related subjects and may be able to establish important contacts for you.**

Setting Goals

Dos and Don'ts

- DO Define the community or area with which you are concerned and determine what sections are at risk to the hazard you are addressing.
- DO Determine what alternative measures are available to lessen the risk and what responses you wish to encourage through your program.
- DO Define your target audiences (social, economic, locational, etc.) and tailor your messages to them.
- DO Be realistic in setting your initial goals.
- DON'T Assume that distributing information will by itself change people's actions.

It is important as a first step to define the risk to the community and examine alternative measures which might alleviate risk. This step does not need highly precise information; your information and risk assessments can be refined later. What is necessary is to understand what section or sections of the community and what kinds of property are at risk. As soon as you identify the risk, you can begin to establish the aims of your awareness program.

Your assessment of the risk might reveal certain situations where increased awareness on the part of officials and/or the public is crucially important. You might discover that in a community which is generally prepared and aware of the risk, certain sections remain highly vulnerable and unaware—a mobile home park in the tornado belt with no tie-down regulations or shelter, or a mountain canyon vulnerable to flash floods where awareness may be low and the warning system inadequate.

As you begin to define the aims of your program, you must decide what behavioral response you want to encourage through your program. Do you hope to encourage response to warnings, purchase of disaster insurance, the construction of homes or businesses to withstand various hazards, relocation of residences out of high-hazard areas, or other worthwhile goals? Your choice could be a combination of the above, but your aims will ultimately determine the content and mode of dissemination of your messages. Determine precisely why increased hazard awareness is necessary or important to your chosen audience, because financial and community support for your program will then be easier to obtain.

Some of your goals will be determined by the nature of the hazard or hazards to which the community is vulnerable. It is much more difficult to initiate and sustain public interest in low probability, high risk hazards such as major earthquakes, or slowly occurring hazards with less immediate evidence of destructive potential such as erosion or subsidence than to achieve an awareness of a more frequent event such as hurricanes and recurring riverine floods. Public education of low probability hazards should be combined with broader programs on public safety, environmental processes or adequate community construction practices and building codes. It is often possible to increase

awareness of such events by latching on to efforts to plan for other, more visible, hazards in the community that have already received more attention.

In formulating program goals and approaches, a survey to evaluate public opinion or level of preparedness for a certain hazard can be helpful (see example Appendix A). Be realistic in setting your initial goals and expectations of program results. Start with simple objectives and materials and gather steam as your effort matures. Two sets of goals—long-range and short-range—are recommended. Among the short-range goals would be to communicate to the audience the susceptibility of certain areas to the hazard and then indicate the correct preparedness steps. Long-range goals would include attempting to gain support for stronger building codes and wise use of undeveloped hazard-prone lands.

Your "target" audience may be local government officials. school children*, industry workers, retired persons, or newcomers vs. hazard veteran's vs. fringe veterans (those who "think" they have experienced the worst possible natural disaster). Some of your own background research or that of others may give a better idea which groups most need the information. This need could vary by type of hazard as well as location. The make-up of a community-social, economic, geographic-will play a part in defining the audience approaches to stimulate the desired behavior. Certain populations are generally harder to reach, but may be the most vulnerable, e.g., the non-English speaking, the elderly, the poor. Identifying and working directly with leaders of your selected audience or community may be the most efficient way of targeting information. Simply giving people good information about a hazard does not necessarily change their behavior or stimulate the desired response. People interpret the same information differently. There are many steps between receiving information, making it meaningful in one's personal life, and actually altering one's behavior. For example, a person may see a T.V. spot telling him that the use of automobile seatbelts can save lives, knows that he has a seatbelt in his car, but still not use the seatbelt.

Gathering Resources

Dos and Don'ts

- DO Check with all relevant government entities when attempting to find funding and other support for hazard awareness programs.
- DO Approach local businesses and industry to gain their support. They have an interest in safeguarding the lives and property of their employees and
- DON'T Forget to include volunteer organizations when seeking resources for your program. Carefully match the skills of each potential contributor to appropriate roles in the program.

Once you have decided to begin a hazard awareness program, where do you obtain the money and resources to get started?

Funding

The few hazard awareness programs actually conducted thus far have tapped as many sources as programs exist.

^{*}Natural Hazards Research and Applications Information Center Institute for Behavioral Science, #6 Campus Box 482, University of Colorado, Boulder, Colorado 80309. (303)492-6818

^{**} See Appendix B for further information on developing a school-based hazard awareness program.

Federal, state and local governmental entities have provided most funds for awareness programs. On the federal level, the Federal Emergency Management Agency (FEMA), National Oceanic and Atmospheric Administration (NOAA), United States Geological Survey (USGS), and the United States Army Corps of Engineers (USCE) are among those which have assisted in the past. On a state level, check your state planning, natural resource, and emergency preparedness agencies. On a local level, check city and regional planning agencies and universities. Water, urban drainage, and other special districts should also be contacted for possible funding assistance.

In general, the more specific and localized informational material is, the more readily it is accepted and utilized. Unfortunately, the availability of funds often travels in the other direction, with the federal level having the most funds for general preparedness materials and the locals having the least for specific materials. However, if the government interest is there, or can be created, cooperation at all levels can ultimately result in the best product. Most important is to get something started, however simple, at whatever level possible.

Support Services

There are many resources which can be tapped to contribute time, skill or services, as well as money to an awareness program. All the government agencies mentioned previously have great amounts of data which would be valuable to instigators of an awareness program. Each state and city government has skilled people (e.g., geologists or planners) who can help prepare risk assessments-probably have maps, and often have slides and photographs. Getting in touch with them early can save time and money in the information gathering stages. Call your city water board and find out who has responsibility for flood control and call the local building inspector's office and talk about building codes for disaster mitigation. A look through the government listings in your phone book and a few phone calls and visits will yield a lot of information and turn up individuals who either have responsibility for hazard awareness or have a genuine personal interest.

In addition to government resources, there are many private and community resources. Insurance agents can be approached to use their contacts to distribute information about hazards and possible protection. Banks and savings and loans can encourage hazard mitigation activities to protect their mortgages and loans. Owners of local businesses and industrial plants may be interested in helping financially with warning systems or in distributing information which would protect their customers and alleviate potential liabilities.

Take advantage of the special skills of concerned citizens. Do not forget to involve and mobilize existing volunteer groups in educating your audience about natural hazards. If they are given accurate information and appropriate roles, volunteer groups or individuals can play a large part in generating hazard awareness. The list of organizations which might become involved is long and varied:

4-H Clubs
Amateur Radio Clubs (RACES-Radio
Amateur Civil Emergency Service)
American Association of Retired
Persons
Girl Scouts
Boy Scouts
Sierra Club
Volunteer Action Centers
League of Women Voters
Civic and Business Clubs

Agricultural and Marine Extension Agents Community Colleges and Universities Structural Engineering Societies Religious Organizations

The Red Cross, although a volunteer agency, plays an official role in disaster preparedness and relief and should also be contacted as a resource and for coordination of efforts.

Remember to consider the ramifications or consequences of accepting the support of a particular group. If the group is controversial or unknown to your target audience, they could do more harm than good. On the other hand, if the right interest group comes aboard, it can often influence government officials, developers, or others to participate and take effective preparedness measures. A network of Voluntary Action Centers coordinating such activities is in place in most states and cities throughout the United States. Headquarters for the Centers is in Washington, D.C.*

Volunteers can aid in localizing and disseminating information through personal contact in their communities. If an awareness program is initiated on a state or federal level, they will provide a way to reach the appropriate people with the necessary messages.

Those who have worked with volunteer organizations in public information programs say that several steps are involved in making their participation effective, including:

Recruitment Orientation Training Evaluation Feedback to the Volunteers Recognition of Achievement Promotion**

Organizers have also found that it is very important to screen individual volunteers. Most volunteers have special talents and experience to offer and it is important to use these appropriately, matching up needs and skills. A teacher or retired advertising executive would have valuable roles to play in an awareness program if their talents were used in the correct way. Boy or Girl Scouts can deliver brochures or "starving" artists might design great posters for free if allowed to sign them and gain publicity for their work. It is important to let each volunteer, whether individual or organization, know what job is to be undertaken, by whom it is to be done and when it is to be accomplished.

In some instances, solicitation of volunteer observers for aid in determining the timing or possibility of natural disasters also serves to increase general public awareness. An example of this type of public awareness is provided by the use of flood watch volunteers by the National Weather Service on a local or regional basis. These citizens provide valuable monitoring along creeks and rivers during critical periods.

Project Earthquake Watch*** uses volunteers from seismically active regions of California to observe specific changes in animal behavior which some say precedes earthquake occurrence. These volunteer observers are pet owners or people who are around animals for much of the time because of their work or hobby. They are recruited by news releases, radio and TV interviews, direct mail, conferences with farm and animal-related organizations, and contact with federally-supported county volunteer organizations. Potential observers for Project Earthquake Watch are screened by a questionnaire and given a specific set of responsibilities, including immediately reporting any unusual animal behavior over a toll free hotline, and keeping a daily log describing the behavior of their animals. All of the above activities

^{*}Contact Executive Director, National Center for Voluntary Action, 1214 Sixteenth Street, N.W., Washington, D.C.

^{**}See Peter Ward, Proceedings of Conference IV, The Use of Volunteers In The Earthquake Hazards Reduction Program, February 2-3, 1978. United States Geological Survey, Office of Earthquake Studies, Menlo Park, California 1978.

^{***}For information, contact Leon S. Otis, Project Leader, Project Earthquake Watch, SRI International, Menlo Park, California 94025.

hopefully serve not only to provide valuable information for prediction research, but to increase general public awareness of the earthquake hazard.

It is important to remember in beginning a hazard awareness program to be creative and resourceful in looking

for potential sources of funding and community support. Part of good planning is tapping as many sources as possible to contribute money and services to your effort.

PLANNING AND COORDINATION OF YOUR PROGRAM

Early Stages

Dos and Don'ts

- DON'T Hesitate to redefine goals and set realistic priorities according to available resources.
 - Avoid duplication and obtain ideas for useful materials and approaches by knowing what others have done.
 - DO Determine exact elements or tasks of your program and set dates for completion of each.

Once initial funding and players are established, planning for the best and most efficient use of funds is essential. It may now be necesary to redefine goals and set priorities in terms of available resources. Initial surveys and contacts should have already established a need for the program and perhaps determined the subject matters on which the program should center.

Finding out what others have done is vital in determining the elements of your program. Contact other states, agencies or institutions which might also be preparing awareness materials. You will have already tapped many of these sources in your initial assessment stages (see Gathering Resources). These contacts can aid in avoiding costly duplication of materials and enable more efficient use of your resources. The likelihood of putting out conflicting information is also significantly decreased through coordination.

Determine the exact elements of your program and the steps necessary to implement each stage. A flow chart or time-line chart (see sample, Appendix C) of proposed activities can easily be put together and modified as necessary as implementation of the awareness program proceeds. In the planning process, it is important to: set forth all elements to be undertaken, by whom they will be done, and when they will be accomplished. A status report sheet (see sample, Appendix D) also allows awareness coordinators to see where they are in their program steps at any one time. It is always smart to start planning one year ahead for the next year's program, since actual production and preparation of materials is time-consuming.

Data Needs

Dos and Don'ts

- DO Determine precise data and information which you wish to communicate to your chosen public and locate the best and most accurate source for each type.
- DON'T Attempt to use information which cannot be transferred into a clearly understandable form.

A basic early step in formulating materials for an awareness program is to search out the best available data and information concerning a particular hazard. Types of data which could be needed include:

- delineation of areas susceptible to the natural hazard under consideration such as earthquakes, mud slides, storm surge, freshwater flooding, erosion, etc.;
- an up-to-date checklist of preparedness measures and safety rules to follow before, during, and after a disaster;
- good photographs or slides showing past damage due to the hazard;
- information on long-term disaster mitigation steps which can be taken to lower future loss of life and property;
- information on road conditions and elevations; and
- · current population at-risk figures for vulnerable areas.

Past experience has shown that correct preparedness actions are the easiest information to communicate. The high cost and amount of time spent in obtaining and communicating accurately mapped data is, however, more difficult. Help from federal and state agencies or local colleges is often available to map vulnerability to hazards. Agencies such as United States Geological Survey, United States Corps of Engineers, National Oceanic and Atmospheric Administration, Red Cross, state parks and wildlife departments or planning agencies often have excellent slide and photographic files available for public use. Check all existing sources of information and choose the best for your purposes. A recent publication by the U.S. Department of Commerce, National Oceanic and Atmospheric Administration and U.S. Department of the Interior, Geological Survey gives an Inventory of Natural Hazards Data Resources in the Federal Government.

It is vital that the information and data collected is accurate and that its validity is subject to as little questioning as possible by the intended users. Since the credibility of the data is so important, some programs have used historical rather than predictive data whenever possible. A possible drawback to using only historical data is that it could falsely lead receivers of the information to feel that the historical examples depicted the worst possible effects of the hazard.

Development of Materials

Dos and Don'ts

- DO Keep it simple, when developing original materials. Have a professional public information specialist and graphic artist translate technical material into a readable and attractive format.
- DO Structure your message to reach most directly those in your chosen audience and relate it to experiences with which they can identify.

^{*}Available upon request from National Geophysical and Solar-Terrestrial Data Center, NOAA, 3100 Marine Street, Boulder, Colorado 80303.

Dos and Don'ts

- Give your audience positive solutions or actions which they can take to reduce their susceptibility to the hazard.
- DON'T Neglect to pre-test approaches or materials to determine their effectiveness.
 - DO Sustain your awareness program from year to year and concentrate on improving the quality of your products each year.

Once the initial workplan has been selected, the budget estimated, the target audiences identified and appropriate data gathered, it is time to put together the most effective package of materials possible. This may mean the development of one really good brochure or one television or radio spot, a basic slide show, the holding of a series of public hearings, etc. "Start simple, but start soon," is the best adage to follow at this point. Do not, however, expect to reach all sectors of the population with one medium.

Having identified your target audience and the desired behavorial outcome during your goal setting stage, you now must decide how your message can best be structured to reach your audience within the limits of your available funds and staff. Slide shows may be most effective with one audience, while printed materials may be the approach to use with another. All the above factors must be taken into consideration when tailoring material to the chosen audience. It is particularly important to be sensitive to special needs of your target population; translate materials for significant non-English speaking populations; do not send information to the poor about insuring the contents of their houses for up to \$25,000. Such seemingly obvious considerations are often overlooked and can undermine the credibility of the final product

As mentioned previously, finding out what others have done is most important, not only in data gathering but in actually putting together materials. Copying is the sincerest form of flattery and if something has been done well in another state or city, why re-invent the wheel? Naturally permission should be sought when reproducing materials, and credit given when appropriate. A paper prepared for the Hazard Awareness Workshop by Joanna Regulska provides a discussion of many ongoing awareness programs.**

Assistance in translating technical information into lay or simple language may be required. This step is essential for the best understanding of materials. Often, professional help, perhaps volunteer, may be obtained. Technicians and scientists are usually not the people to accomplish this step. Relating the data to a situation with which a person can identify is helpful. For example:

- Portray the percent of damage reduction to a structure if certain hazard-resistant building techniques are used;
- Give the savings in insurance costs if certain actions are taken:
- Provide graphic representation of earlier losses in a neighborhood.

Develop contacts with and support from professionals in advertising, public relations, or the media. Universities or colleges in local communities are a good source as are the public information officials in the appropriate state or federal agency.

Find and use a good graphics person to do your printed layouts. It is important that the awareness material be easy to read and instantly identifiable. An eye-catching, consistently used logo is a good idea. Basic materials will need an occasional update, but never a complete revision if done correctly the first time around. Utilize the unique expertise of each individual involved in the awareness program (writers, planners, artists, good solicitors of support, etc.) and buy your expertise, if needed.

As discussed earlier, people are more likely to listen to concrete human experiences interwoven with data, rather than to a simple presentation of dry statistics. Also, the more the material can be localized, the more useful it will be. If a citizen can find his/her community, street, or house on a map delineating the flood or earthquake zone, then the information will be more meaningful.

Once you have communicated the problem to your audience, be sure to give them a solution or positive actions which they can take to alleviate their vulnerability. Do not leave them dangling. Instead, explain the benefits to be received from taking certain kinds of actions.

Once is not enough. It has been found that awareness information and emergency warnings must be repeated and reinforced. A sustained program becomes vital in this context—a one-shot blitz will not be adequate. Over-saturation of information may be possible, but this has not yet been proven.

In the long run, it is quality not quantity that will determine the success of various elements of this program. Before you launch a full-scale program, conduct a pre-test of your materials. Advertising and communication departments in local universities may be willing to test program materials as class projects. Be most concerned with how well your material is done, not who gets the credit for it. If you try to turn an awareness program into a promotional campaign for an agency or industry, credibility is lost.

Choosing Your Approach

Dos and Don'ts

- DO Try to determine the most effective means of reaching your chosen audience, but do not rely on only one form of media or approach to reach them.
- Keep and update a file of all organizations, publications and individuals who should regularly receive awareness materials.
- DO Use newspapers for long-term education of an audience concerning the nature of an area's susceptibility to natural hazards and to encourage readers to write for further information.
- DO Use short (10, 30, or 60 second) T.V. spots to alert or change your audience's perception of the dangers of, or their susceptibility to, the natural
- DON'T Expect material developed for radio to have the same impact as visual presentations, but do use it to reach appropriate audiences.
 - DO Consider the use of a simple, inexpensive but attractive brochure or poster if you wish to maintain a sustained effort and reach broad segments of the population.

^{**&}quot;Public Awareness Programs for Natural Hazards," is available from the Natural Hazards Research and Applications Information Center, Institute of Behavioral Science, #6, Campus Box 482, University of Colorado, Boulder, Colorado 80303, (303)492-6818, for \$2.00 to cover the costs of reproduction and mailing.

What types of materials or approaches can be used in a hazard awareness program and which have been found to be most useful in getting across specific messages to specific publics?

A hazard awareness program is necessary, because most people do not perceive the threat of danger from natural hazards as a real problem. Research has shown that for issues in which an individual feels little real involvement, the message is best communicated by using primarily visual media which require minimal attention and effort to be understood.* For this reason, predisaster, long-term awareness efforts will probably have a better effect through television and newspaper exposure than if presented on the radio. Ultimately, if one form of media is resistant or seems not to produce the desired results, go to other forms. When your campaign begins to get the attention of the public, other media forms will usually pick it up.

Options for getting the word to the people include:

Television
Radio
Newspapers
Slide Shows
Films
Speakers Bureaus
Local Magazines (chamber of commerce, real estate, etc.)
National Magazines
Brochures
Brochures
Billboards
Interpersonal Contacts
Public School Education

Each of these vary in cost, will require different approaches and will very likely reach different audiences. Whatever option is chosen, a file of names and addresses of persons, organizations, stations or publications which should regularly receive material issued from your program should be maintained and periodically updated.

Mass Media

One overriding rule to keep in mind when deciding to use the mass media—radio, television, and newspapers—is: KNOW YOUR LOCAL MEDIA. It is vitally important to establish some sort of personal communication with the people who make decisions in each media organization—such as the city editor, the news director, or the science and environment reporter. A general media list for press releases, media kits and other materials can be compiled from various sources such as state media directories or local phone directories, but follow-up face-to-face contact is usually necessary to insure product usage.

At a recent Hazards Research Workshop, the editor of the Boulder Daily Camera stressed the importance of personal communication. He said that his newspaper receives 400-500 press releases a day and that those which are obviously part of a large mailing (identified by computer labels or bulk permits) are filed in the wastebasket without being opened.

Early in your awareness efforts, you should drop by the local television and radio stations and the newspaper offices, introduce yourself and let them know what you are doing. Then when your organization is doing something that is newsworthy, let your media contact know through press releases or personal phone calls if time permits. Your meeting, rally, or other efforts will then have a better chance of being given consideration. However, do not always count on the media to further your own goals. It is their responsibility to report the news; it is their job to decide which among the many things occurring every day will be covered.

One approach which has had some success is to furnish the media with a feature story which is more entertainment than news. For example, on the anniversary of an historic flood, a story interviewing a senior citizen who experienced the disaster talking about his/her own experiences in the flood and the changes which took place in the community afterward, is useful copy and, if accompanied by old photographs of easily recognizable locations that were inundated, would provide a good opportunity for raising awareness to the risk of future floods and mitigation actions. A moderate earthquake in California might provide a similar chance to feed information to the Salt Lake City papers about earthquake potential in Utah.

In the event of a natural disaster, it will be important for all media to be familiar with the community's emergency preparedness plans. Perhaps a briefing for the media can be arranged through a local emergency planning agency. This would provide a unique opportunity to educate the media not only about their crucial role during times of emergency, but also about the potential role they could play in informing the people of actions that could be taken to lessen the effects of future disasters.

Newspapers. If you can convince newspapers to use your materials they can be a very effective means of reaching certain audiences. Provision of camera-ready preparedness checklists or ads giving an address on how to obtain further information are usually well-received by newspaper editors. Pictures (8x10 black and white glossies) showing past disasters with a brief descriptive text might be used, especially if they are keyed to the state or local area. Timing the release of material can be important. If there is a disaster approaching or if some recent incident has called public attention to the natural hazard with which you are concerned, the media may be eager to receive your materials. Take notice of deadlines for newspapers if you wish your material to be run on a specific day.

A series of articles could also be developed concentrating on various aspects of the hazard—its general characteristics and means of destruction, areas most vulnerable, increased population and development in these areas, current construction practices, effects of the hazard on state or local industry or tourist business, warning techniques and preparedness steps. Quotes from government officials (especially local or regional), industry representatives, hazard experts (meteorologists, geologists, researchers) help to increase the impact of the articles. A professional writer should do this type of series since the style and format can make a significant difference in the acceptability of your message. If you do not have one on your staff, you can hire a free-lance writer or graduate journalism student to do it for you.

At times, you may have to pay for advertising space in large newspapers but small weekly papers or dailies are often glad to get and use interesting material. Currently, sample costs for a quarter page newspaper ad or space can run from \$1,400-\$1,500 in a big city newspaper, to \$390 in a city with around 350,000 people, to as little as \$120 in a small-town newspaper. Inserts can be cheaper and more effective than paid advertising space within the paper itself.

Television. One study** has shown that television (especially 10, 30, or 60 second spots) may be the way to change people's opinions on the dangers of various hazards. In addition, spots can give an address where further information (maps, brochures) can be obtained. If recorded spots are to be distributed to T.V. or radio stations, a written script should accompany each one. Another option existing for T.V. includes the use of longer documentary films. Permission can usually be obtained from appropriate government or volunteer agencies (Red Cross) to use film clips from their

^{*&}quot;Mass Media Usage in Natural Hazards Awareness Efforts," informal paper prepared by Rahul S. Sood, Institute for Communication Research, Stanford University, Stanford, California, March 1979.

^{**}Carlton Ruch and Larry Christensen, "An Assessment of Brochures and Radio and Television Presentations on Hurricane Awareness." *Mass Emergencies*, March (1978). P. 209-216.

products to cut costs in making more regional or localized spots or films. For T.V. use, any message should be especially simple and easily understood. Remember that if used at all, spots and films released for public service T.V. time will more than likely be aired during non-prime time hours (early in the morning or late at night). In the case of weather-related hazards, your local T.V. weatherperson can be a valuable contact for dissemination of information.

Live or taped interviews also provide a good means of presenting hazard information to the public. Again, personal contact is more likely to get your representative on local talk shows. In doing interviews with the news media, whether printed or broadcast, be sure that your spokesperson has all the necessary facts regarding preparedness and hazard characteristics. An information sheet should be provided to the reporter or interviewer in advance to aid them in asking relevant questions.

Provision of camera-ready material, including slides to local T.V. weatherpersons (if the hazard is weather-related) for use during their regular weathercasts has proven to be a successful approach. A script or descriptive text should always accompany each slide.

Paying for T.V. time is expensive and can vary from \$25 for non-prime time (7:00 a.m. to 9:00 a.m.), up to \$500 primetime (7:00 p.m. to 10:00 p.m.) for a one-time, 30-second spot. The cost for a 60-second spot will be approximately double that of the 30-second spot. These figures represent average costs only and variation in pricing will occur from station to station. Your budget, aims, and the proposed audience will help you decide if it is worth the money.

Radio. Even though radio may not be the most effective way to reach all sectors of the population, there may be some people for whom it is a useful method, e.g., teenagers or for populations in remote areas. Your options for radio include spots of varying lengths, one-shot interviews with knowledgeable people, or a continuing taped series providing information on a specific hazard. These approaches can be ends in themselves or they can act as stimulants to get people to write or call a specific place for further information.

If these prepared materials are given to stations as public service advertisements, the radio stations are not required to use them. Although they are required to use a certain amount of public service material, they are free to pick and choose which material they put on the air. If they do use your material, it is often not played in the prime listening times (6:00 a.m. to 10:00 a.m., or 3:00 p.m. to 7:00 p.m. for AM stations, or 12:00 noon to 12:00 midnight for FM stations), when the listening audience is higher and more paid advertising is available. Of course, this may not be true if a disaster is imminent, and sometimes, if a hazard is seasonal (hurricane or tornado). Contact with station program directors can be important in determining whether your public service material is used or not.

It may be necessary to pay for your information use. In radio, 30- and 60-second spots, or shorter, are usually preferred and a sample cost for a station serving a city of 350,000 would be \$9.00 for a run-of-station (ROS) 30-second spot. ROS spots can be aired by the station anytime they choose, usually, of course, in non-prime time hours. Assurance of prime air time for your spot would cost approximately double, or \$18-\$20 in this example, for a 30-second spot. A 60-second spot would double the costs for either ROS or prime-time. A station may also have other package deals which could reduce the costs of paid programming.

Radio stations serving smaller areas are often more receptive to use of public service material, since they may have less paid advertising. Purchase of time at stations reaching large audiences and counting on public service time at smaller stations could be one way to handle the situation if your budget permits.

Alternative Approaches

Brochure. A single, simple, but attractive "preparedness and awareness" brochure may be the best first step in increasing the awareness of your target audience. A brochure is usually the least expensive type of material to develop

and produce (the Texas Hurricane Awareness Program produced their initial two-color brochure for under $2\% \epsilon$ per copy) especially if you are attempting to reach a very large audience and have limited funds.

Such a brochure should present the hazard problem in terms with which the intended audience can identify and also provide solutions for them to consider. Solutions might include preparedness steps, evacuation routes, or information on building codes depending on the particular aims or goals which have been set for the program. If possible and applicable, use maps in your brochure with the hazard identified for as localized an area as possible. If your hazard area and audience covers the entire state or nation, budget constraints could limit the detail of your map. The brochures should be primarily pictorial in orientation with a minimum of text and should have an extremely attractive style to encourage people to post them. Succinct, simple preparedness messages could also be included. A good graphic artist should do the design and layout for the brochure.

Distribution of an awareness brochure can be accomplished through a variety of ways. If the brochure is developed through a federal or national entity, then it is usually shipped to regional or state offices whose job it is to get it in the hands of the designated public. If the state disaster emergency services division develops the brochure or offers their cooperation, they can distribute it to local disaster preparedness coordinators who can distribute it in their area. The brochure could also be distributed door-to-door by volunteers, mailed from an advertised single address, or set out in display racks in shopping areas.

Display Booths. Display booths that could be easily set up in shopping areas or civic centers could be used as a relatively cheap tool for communicating awareness information. The displays could use video cassette players, slides or photographs. Simple, graphic messages are most effective. You should include handouts that contain specific suggestions for constructive personal actions.

Public Meetings. Attendance at public meetings to discuss natural hazards will, of course, be difficult to encourage in the early part of your program. A useful approach is to work through civic or volunteer groups that might allow you to take advantage of their regular meetings and present your message. Perhaps a parent/teacher organization of a school in a vulnerable location would welcome a speaker at their monthly meeting. The chamber of commerce might be interested in a discussion of possible liabilities that business might face if customers were exposed to a hazard while on their property. Civic and study clubs are always on the lookout for interesting programs. It would be useful to develop a list of knowledgeable people in each location who would be willing and competent to speak about the hazard at public gatherings. Such a speaker's bureau has been used successfully in the Texas Hurricane Awareness Program through the cooperation of coastal Sea Grant marine extension agents and the National Weather Service. It is very important that the speakers chosen be regarded by the community as having good credibility on the subject of the

Local publications, chamber of commerce magazines, or real estate publications may also be glad to use your printed material, especially if straight information rather than scare tactics are used. However, personal contacts are usually needed to explain the purpose of your awareness program and the materials which are available for use.

Other Approaches. Some campaigns have found rather unique sources of free distribution of their information. Paper bag companies have been willing to print information about hurricane and tornado safety at no additional cost on bags distributed to grocery stores along the Gulf Coast and in inland tornado-prone areas. The phone company in some parts of the U.S. has printed safety tips in the front pages of phone books, including earthquake preparedness in California and tsunami precautions in Hawaii. The City of Boulder, Colorado, has included messages about the flood plain in its monthly water bills. Remember, whatever approaches you try, always be open for new ideas and new interests.

EVALUATING YOUR PROGRAM

Dos and Don'ts

- DO Determine which program elements are most effective for specific audiences.
- DO Determine if your information is actually changing attitudes and actions.
- DON'T Assume that your target audience has necessarily altered their behavior or attitudes as a result of your program.
 - DO Use several different approaches in determining your program's effectiveness
 - DO Make your evaluation a continuing, regular part of your program.

Once your program is underway, it is imperative that you evaluate it. Are you reaching your goals? Are all aspects of the program accomplishing what you intended? If you are using more than one type of approach, you should try to determine which elements are most effective for each of your goals and which elements are reaching each of your target audiences. It is important to test to see if your information is changing attitudes and actions, not just whether or not people are receiving the information. A periodic evaluation will also give you ammunition for encouraging further support of your program.

Some of your goals will be simple to measure. If you are trying to encourage citizen participation in setting up a volunteer flash flood warning network, you will know you are successful when the network is operational. If you wish to encourage the purchase of earthquake insurance, you can check with local insurance companies to see if sales have increased.

One simple technique for getting a rough measure of whether or not anyone is paying attention to your message is to offer more information to those wishing to write or call. The Texas Coastal and Marine Council has done this through T.V., radio, and newspaper ads and has received very good response. The requests for information have helped to determine specific media use of public service materials as well as an estimate of the number of people affected by it. Inclusion of response questionnaire forms in media kits or packages will also give some idea of media use and evaluation of the acceptability of materials. Another technique for determining printed media usage of materials is to maintain a clipping file of newspaper and magazine articles and ads using your awareness material. Note on file cards the newspaper name and date of each use. The circulation number of each newspaper can be noted and then tallied to gain a rough estimate of persons reached by your message.

Of course, these simple measures are not able to give you any indication of the factors at work in the changes that they record. For example, you might find that more people are buying flood insurance, a possible indicator of increased awareness. But how do you know if it is the result of your program or of other factors, such as the mortgage requirement by local banks that susceptible new residences be covered by flood insurance, or publicity about a recent flood in a neighboring community?

More accurate assessment of a program can be obtained by using several different methods such as:

- · telephone or mail surveys.
- person to person interviews determining sight recognition of materials, and
- utilization of volunteers for testing various approaches and types of materials used in your program (T.V. spots vs. longer films, fear approach vs. simple listing of preparedness steps).

If you conducted a formal survey in the process of "setting goals," now is the time to conduct a second survey to see if your program has changed people's attitudes or increased their knowledge. Techniques such as the above have been developed for evaluating public information programs, and you might find it worthwhile to hire someone skilled in those techniques to do your evaluation for you. This approach was used by the Texas Coastal and Marine Council and by the Denver Urban Drainage and Flood Control District to test the effects of their public information campaigns. The results and an explanation of the methodologies used are available in published studies.* Samples of evaluation questionnaires for a multi-approach hurricane awareness program and a slide show presentation are given in Appendix E.

If your budget does not initially allow for a full-blown evaluation effort, contact a nearby university professor willing to take on the evaluation as part of a communication or research methodologies class. The final alternative would be to pay someone to develop an evaluation technique for you, or adapt one from a similar program, and then administer the survey using in-house staff, volunteers, or others already involved in your program. This approach is not recommended, since objectivity is important and evaluation results could tend to be biased by those directly involved in the program.

After you have assessed the effectiveness of various elements of your awareness efforts, the results can be used to improve your overall program. This periodic evaluation of your efforts will provide an indication of how your program has changed the hazard response of your target audience, and materials can then be adapted accordingly.

CONCLUSION

The provision of information on natural hazards to those vulnerable to their destruction is a necessary responsibility of informed government officials and private citizens alike. Increasing awareness and providing preparedness alternatives is a more complicated process than might be supposed. Guidelines which have worked in the past have been presented in the preceding discussion and will hopefully serve to make the job easier for those involved in communicating this vital information to the public. Ultimately, for those who are located in hazard-prone areas, it is not if they will need this information, but when.

^{*}Carlton Ruch and Larry Christensen, "Assessment of Brochures and Radio and Television Presentations on Hurricane Awareness", Mass Emergencies, March 1978. Ruch and Christensen, Hurricane Response Model, Center for Strategic Technology, Texas A&M University, College Station, Texas (in progress). Marvin Waterstone, Hazard Mitigation of Urban Floodplain Residents. Natural Hazard Research Working Paper No. 34, University of Colorado, Boulder, Colorado, 1978.

APPENDIX A

SAMPLE PUBLIC QUESTIONNAIRE PRECEDING INSTIGATION OF HURRICANE AWARENESS PROGRAM

Name:

Address:

Age.

Occupation/Education Level:

- 1. How long have you lived on the coast?
- 2. Have you ever experienced a hurricane?
 - a) Where?
 - b) When?
 - c) Outcome?
- 3. Did you consider the possibilities of hurricanes before you moved here?
- 4. What are the first two or three things you would do to prepare for a hurricane?
- 5. Do you feel your home is the best place to 'weather' the storm?
 - a) Why?
 - b) How would you (do you) evaluate its structural soundness?
 - c) How do you estimate its elevation above sea level?
- 6. When you were looking at your home, did anyone discuss these things with you?
- 7. If you wanted to know what winds your home was built to withstand, how would you find out?
- 8. If the Weather Service predicted twelve foot tides for your area, what would that mean to you personally?
- 9. Do you know where the nearest public shelter is? Can you get there if the streets are under two or three feet of water?
- 10. How many feet of water (flood level) does it take to close the causeway to your town?
- 11. Where would you go if you evacuated your town?
- 12. Where would you go for more information on hurricane protection?

SCHOOL-BASED HAZARD AWARENESS

Programs to educate school children on the disaster potential of natural hazards could have long-term payoffs in developing desirable public disaster preparedness and response behavior. By making hazard education a part of the regular curriculum, children will be prepared to consider potential risks in making future decisions on emergency response, construction of homes and location in hazard-prone areas. The success of the 4-H Program in introducing new farming techniques provides an example of the possibility of not only changing the awareness of the children, but also of the children educating their parents in the shorter term.

A comprehensive study has been done for the National Weather Service on the existing weather awareness education programs (specifically hurricane) in U. S. coastal states.* The findings and recommendations from this study are useful for any hazard awareness program which has as one of its goals the effective education of school children. A summary of the findings is contained in the following discussion.

Every state education system is set up differently and this fact must be taken into account when attempting to place hazard awareness and preparedness materials in the schools. Efforts to introduce new materials into the schools should always be coordinated with the appropriate school personnel and curriculum designers.

Preparedness efforts have more chance of being accepted by school systems if they can be introduced within existing courses, e.g., science or social studies. Further, school personnel are more likely to use hazard awareness program materials if they can be approached from a broad rather than a narrow perspective. For example, a unit on general weather education could be taught, relating it to conditions students can observe every day, and then a more specific discussion on hurricanes or tornados can be easily introduced. Earthquake awareness could be taught in a similar manner as part of a larger unit on basic geology. In general, the fifth-sixth and/or junior high level are seen as the best levels for hazard awareness program instruction.

In developing specific school-based materials focus should be placed on the nature of the hazard and its impact on people and property. Students can then develop their own set of reasonable guidelines for hazard response based on their newly acquired knowledge. This approach has been found to be more acceptable to educators than simply providing a list of safety rules. Printed preparedness checklists can be a supplement to this activity and can be taken home by the student for family discussion.

Hazard awareness materials should contain some locally-oriented material in addition to material of general interest for more widespread use. Review of local historical occurrences of hazards can often be an effective teaching tool. Knowledge of school, family, and community preparedness plans can also be acquired by the student at this time. State universities can often aid in the development of educational units through their extension service or education departments.

Any instructional materials prepared for school-based hazard awareness efforts should be economical and primarily self-contained. Quality and acceptability of materials should be reviewed by technical and educational specialists as well as teachers who will use them. Preand post-testing in actual classrooms will ensure the effectiveness of the final product.

^{*}Ira W. Geer, Increasing Weather Awareness—Hurricanes, An Assessment of School-Based Hurricane Education in the Gulf and Atlantic Coastal States. Office of Disaster Preparedness, National Weather Service, NOAA, Department of Commerce, Rockville, Maryland. December 1978.

Maps/Bochuss A Retai Darribution Dis				EXAMPLE LIME-LINE CHANT FUN A "HURNICANE AWARENESS PHOGRAM		A A A A A A A A A A A A A A A A A A A			
	MARCH	APRIL	MAY	JUNE	ישר	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER
***	rd/aqaM Abro	Maps/brochures Survey ordered cards printed	Cards ready maps/brochures in headquarters						
	Display racks ordered			Racks					
	Cardboardwire Iabletop holders ordered	ardwire holders ered		Cardboardwire tabletop holders delivered					
	Sign & labels for holder & window ad drawn-up/printers		Sign & labels delivered						
	Determination of local contacts in each erea & decision on & visit w/outlets	Local coord: worksheel drawn-up d distributed		Placement of materials & stands	10 12 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	Follow-up & mainlenance		Formal evaluation of program	
B Direct Mani				HANDLED FROM MAIN OFFICE	MAIN OFFICE				
C Plantindustry Distribution	Dete	Determination of industry contacts and visits with them		Plecament of appropriate materials	nn ol materials	Follow-up &	iup â nânce		
D Labor/Unions	in i	Initial contact with union leaders		Placement of appropriate materials	ant of materials	Follow up & maintenance	rup &		
E Civil Delense tree	Draw up con- tract wisters CD CD- CD-85.000	Contact local CD directors	Maps/brochures deti- vered to state CD						
il. Madia	MARCH	APRIL	MAY	JANE	אחרא	AUGUST	SEPTEMBER	OCTOBER	HOVEMBER
A Newspapers	Prepara Of Can	Preparation and reproduction of camera-ready materials	Distribution						
	Prepara	Preparation of press releases. feature stories	Distribution			No.			
> I	Locate	Locate and reproduce pre- viously released spots	Old spots ready and in hands of T V					erries les	
	Product	Produce any new spots	New spots ready and in hands of T. V.			Follow-up risit to see if using, elc.	•		
C Radio	Draft new radio		Record new Spots at spots a radio stations						
	S -	Conduct 5 minute Edit 4	Edit & distribute			Follow-up visit			
H Sude Show/Film	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	DCTOBER	NOVEMBER
Stude Show		- Selection of slides - Design of slides to be made to artist Draft text/format for		Present slide show					
		handout – printers Make contacts – establish show schedule							
NOAA Film Hurreane Decision		Film Arrival		Film as back-up in place of slide show	how		•	Formal evaluation of program	
DCPA Film		Film Arrival		Film as back-up in place of stide show	inow.				
Red Cross Film		Film Actival		Film as back up in place of slide show when appropriate	wedi	-			

APPENDIX D

	Target	Actual	Status	Comments
. MAPS (cont'd)			1	
S. Retail Distribution				
C. Plant/Industry Distribution	 			
1. Industry Contacts & Visits with them	1 May	some contact pending 20 May	— 3 Weeks	
2. Placement of Materials	15 June			
D. Labor/Unione				
1. Initial contact with union leaders	1 May	Pending 20 May	— 3 Weeks	
2. Placement of Materials	15 June			
3. Follow-up and Maintenance				
E. Civil Defense				
Draw up \$5,000 Contract for Funda with				
State CD	15 March			
2. Contact Local Civil Defense Directors	1 May	Pending 20 May	— 3 Weeks	

STATUS REPORT OF SAMPLE HURRICANE AWARENESS PROGRAM — MAY 20

	Target	Actual	Status	Comments
I. MEDIA (cont'd)				
C. Radio				
1. New Radio Spots				
e. Dreft	16 April	Pending 20 May	- 5 Weeks	
b. Record	7 May	Pending 20 May	— 2 Weeks	
c. To Stations	1 June	Pending 20 May	+ 1 Week	
2. Radio Interview Series				
e. Conduct	20 April	Pending 20 May	— 4 Weeks	
b. Edit and Distribute	20 May	Pending 20 May	•ven	
I. SLIDE SHOWIFILMS				
A. Silde Show				
1. Selection of slides and design of				
slides to artists	7 May			
2. Draft text	1 May	Pending 20 May	— 3 Weeks	
Format for Handout/Printers				
3. Make Contacts — Establish Show Schedule	1 May	Pending (some set up) 20 May	— 3 Weeks	
	1	1	1	

STATUS REPORT OF SAMPLE HURRICANE AWARENESS PROGRAM -- MAY 20

	Target	Actual	Status	Comments
III. SLIDE SHOW&FILMS (cont'd)		<u> </u>		
B. Films				
1. Hurricane Decision				
2. Red Cross Film				
3. DCPA Film				
		-	-	
		 	 	· · · · · · · · · · · · · · · · · · ·
		<u></u>		

APPENDIX E

Jame	
urrent Address	Phone
lave you ever experienced a hurricane? YesNo_	
f yes, was your residence damaged? Yes No did you or a member of your family sustain injuries?	V No
did you evacuate? Yes No	YesNo
lave you had any special training in hurricanes? Yes	No
f yes, where?	
f yes, where?	
Did you obtain a copy of a Hurricane Survival Checklist and	Man? Van Na Maranda van adill
t? Yes No Did you read it? Yes No	. How did you obtain it?
Do you remember seeing any "Hurricane Awareness" televisio	
Do you remember hearing any "Hurricane Awareness" radio s	nots? Ves No
SECTION ONE	
Please indicate your sources of Hurricane Information. Check	and of the following which apply:
School Classes	
2. Hurricane Survival Checklists and Maps	9 Newspapers
3. Local Civil Defense	8. Television Presentations 9. Newspapers 10. Other People
4. Local Red Cross	II. Mayor
5. Educational Television Programs	12. County Judge
6. Public Meetings	11.
7. Radio Announcements and/or Interviews	
SECTION TWO	
Please briefly indicate what the words "Storm Surge" mean t	o you (if you have no idea. out "Don't Know").
lease offering interests when the world offering angle invent	
low many feet of rising water do you believe a hurricane can	produce?
What do you estimate the land elevation is at your residence	
Out of every ten persons killed by a hurricane, how many do	
Annrovimately how many miles of a coastline can suffer seve	
Approximately how many miles of a coastline can suffer seve	re damage from a hurricane?
When a hurricane hits the coast, where do you think the most	re damage from a hurricane?
When a hurricane hits the coast, where do you think the most Near the center of the area hit Near the	re damage from a hurricane? destruction will take place? edge The same throughout
When a hurricane hits the coast, where do you think the most Near the center of the area hit Near the How many miles do you live from the nearest salt water bay	re damage from a hurricane? destruction will take place? edge The same throughout or coastline?
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I. I would evacuate immediately. J. Other type of response: Watch means that there is a real possibility of a hurricane striking an area. Warning means that a hurricane is expected to hit an area within 24 hours.	
J. Other type of response: Watch means that there is a real possibility of a hurricane striking an area. Warning means that a hurricane is expected to hit an area within 24 hours.	H. I would board up the windows, tie down loose objects, and evacuate.
Watch means that there is a real possibility of a hurricane striking an area. Warning means that a hurricane is expected to hit an area within 24 hours.	
Warning means that a hurricane is expected to hit an area within 24 hours.	J. Other type of response:
Anniens.	* Watch means that there is a real possibility of a hurricane striking an area. * Warning means that a hurricane is expected to hit an area within 24 hours.
	omments:

APPENDIX E

HURRICANE AWARENESS SLIDE SHOW QUESTIONNAIRE

Was the material presented in an understandable manner?	yes	по
Will the material just presented help you prepare yourselves and your property for a hurricane?	yes	по
3. Did you learn anything new about hurricanes and how to prepare for them?	yes	no
4. (a) Did the speaker talk loud enough? (b) Would you suggest another program on this subject next year?	yes	no
5. (a) Have you ever experienced a hurricane? (b) If so, when and where? (c) Did you suffer any loss of property?	yes	
6. Additional comments (please be candid).		
Signature not necessary, but would be appreciated.		

STATE-LOCAL-FEDERAL ROLES IN HAZARD AWARENESS PROGRAMS

Ideally, all hazard awareness campaigns would be formulated and conducted at the local level, so that they could be made as specific and meaningful as possible. Unfortunately, funds, technical expertise, and time to devote to developing awareness efforts may not be available at the community level. Thus, each level of government and the private sector should contribute whatever it can do best to an awareness effort.

The Federal Level

The federal agencies and the research which they support should most appropriately provide:

- · general information on each hazard;
- Federal legislation and policy support for awareness and other hazard mitigation efforts;
- technical assistance (delineation and mapping of hazard zones, advice on building standards, floodproofing, etc.);
- basic preparedness advice;
- encouragement of long-term planning with aim to lessening future losses;
- support for good research regarding human attitudes and response to various natural hazards so as to increase efficiency of future awareness programs; and
- survey damages after a disaster for use in refining future preparedness efforts.

Discussion on the role of the federal level has also posed some questions: Should the "feds" be imposing their beliefs on what attitude people "should" have in regard to natural hazards? How is federal policy (read \$) encouraging possibly inappropriate responses to natural hazards (e.g., rebuilding extremely hazard-prone areas with federal relief funds)?

The State Level

State level response to the hazard awareness problem depends on the attitude of state emergency preparedness officials and the support for such efforts within the legislative process. Given some support, the state level can provide:

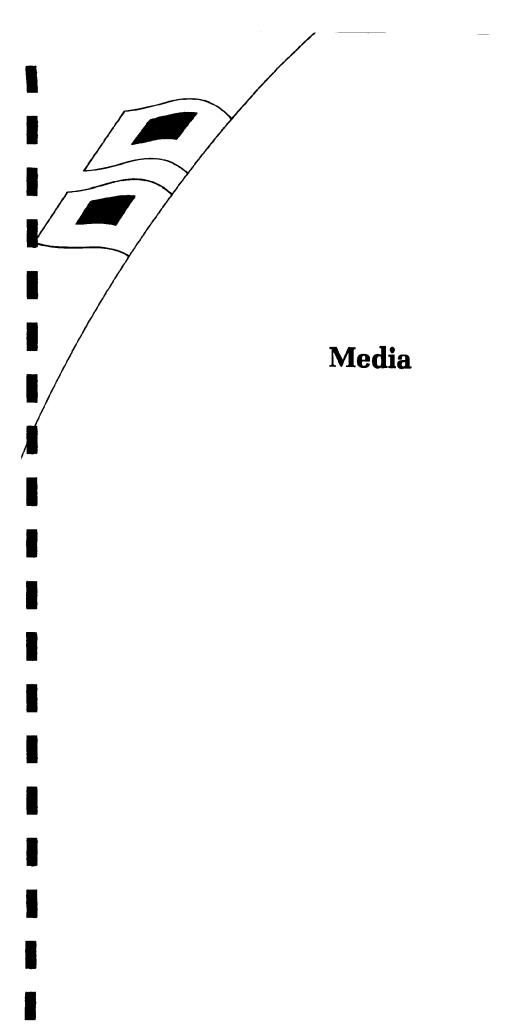
 planning and development of basic materials keyed to a specific state which can then be localized (perhaps leaving blank spaces for printing local phone numbers, shelters, evacuation routes, etc.);

- a good pass-through for federal funds designated for awareness/disaster mitigation programs;
- aid in identifying risks;
- aid in identifying sources of funding and technical assistance whether state or federal level sources; and
- providing support and perhaps funding for hazard awareness programs through state legislation and igniting interest on the local level for such programs.

The Local Level

The general consensus is that local officials, and leaders should have the ultimate responsibility in their areas for increasing awareness and preparedness to natural hazards. Actions which are most appropriate to the local level include:

- finding and using as a rallying point a community leader with good standing, credibility, and interest in the natural hazard problem;
- monitoring and updating descriptions of local conditions (road, building construction, population influx) which would impact public preparedness measures;
- encouraging participation in awareness programs by local businesses, industry, civic clubs, etc.; and
- localizing federal and state hazard awareness materials to fit a specific area or, if possible, developing their own where needed.





MEDIA

Hurricane Awareness

Devastating Facts About Hurricanes

Federal Emergency Management Agency / National Oceanic and Atmospheric Administration - U.S. Department of Commerce

	Deaths	Estimated Damage*
Galveston, Texas (1900)	6,000	\$ 30 million
Florida Keys and Texas (1919)	600-900	\$ 22 million
Okeechobee, Florida (1928)	1,836	\$ 26 million
New England (1938)	600	\$306 million
Diane - North Carolina to New England (1955)	200	\$832 million
Audrey - Texas to Alabama (1957)	390	\$150 million
Betsy - Florida and Louisiana (1965)	7 5	\$ 40 million
Camille - Mississippi, Louisiana, Alabama, Virginia, West Virginia (1969)	256	\$ 90 million
Celia - Texas (1970)	11	\$ 36 million
Agnes - Florida to New England (1972)	122	\$504 million
David - Puerto Rico and the Virgin Islands (1979)	3	\$141 million
Frederick - Mississippi, Alabama, Florida Virgin Islands (1979)	13	\$493 million
Allen - Texas (1980)	6	\$ 1.6 billion
Iwa - Hawaii (1982)		\$ 11 million
Alicia - Texas (1983)		\$ 40 million
Diana - North Carolina (1984)		\$ 3 million





Federal Emergency Management Agency / National Oceanic and Atmospheric Administration - U.S. Department of Commerce

To make your hurricane awareness efforts more effective, we suggest you work closely with your local media. Most people in your community are touched by at least one element of the media--radio, television, newspapers. Experience has proven that people respond more quickly and with less panic if they are informed <u>in advance</u> on what to do in a disaster.

Following is a sample media package containing information on what people should do before, during, and after a hurricane. We suggest you adapt the materials with specific local information whenever possible. Included are:

RADIO SCRIPTS formatted in :10, :30, and :60 second spots, and

an ARTICLE designed to run whole or as a series in daily or weekly publications.

As hurricane season approaches, take the time to visit each every radio station manager and newspaper editor in your community to discuss use of this material.

Radio Scripts



Federal Emergency Management Agency / National Oceanic and Atmospheric Administration - U.S. Department of Commerce

MEDIA

Radio Scripts

Hurricane Watch and Warning

:10 seconds

WHEN A HURRICANE <u>WATCH</u> OR <u>WARNING</u> IS ISSUED, LISTEN FOR OFFICIAL BULLETINS AND BE PREPARED TO ACT QUICKLY. THIS HURRICANE SAFETY TIP IS FROM

ACT QUICKLY WHEN A HURRICANE <u>WATCH</u> OR <u>WARNING</u> IS ISSUED, AND LISTEN FOR OFFICIAL BULLETINS. THIS HURRICANE SAFETY TIP IS FROM

KNOW WHAT A HURRICANE <u>WATCH</u> AND <u>WARNING</u> MEAN. IN BOTH CASES, STAY TUNED FOR OFFICIAL BULLETINS. THIS HURRICANE SAFETY TIP IS FROM

Hurricane Watch and Warning

:30 seconds

IN HURRICANE LANGUAGE, A <u>WATCH</u> MEANS A HURRICANE IS
THREATENING; A <u>WARNING</u> MEANS THE STORM IS CERTAIN. WHEN A
HURRICANE <u>WATCH</u> IS ISSUED, LISTEN TO THIS STATION FOR THE LATEST
WEATHER SERVICE ADVISORIES AND FOR INSTRUCTIONS FROM YOUR LOCAL
GOVERNMENT. BE PREPARED TO ACT IMMEDIATELY IF THE <u>WATCH</u> IS
CHANGED TO A WARNING. THIS HURRICANE SAFETY TIP IS FROM

MEDIA Radio Scripts

Preparing Your Home

·

:30 seconds

A THREATENING HURRICANE MEANS YOU MAY HAVE TO ACT FAST. IF YOUR HOME IS STURDY AND ON HIGH GROUND, STAY THERE UNLESS ADVISED TO EVACUATE. LEAVE MOBILE HOMES FOR MORE SUBSTANTIAL SHELTER. BOARD UP WINDOWS OR PROTECT THEM WITH STORM SHUTTERS OR TAPE. TIE DOWN OR MOVE OUTDOOR OBJECTS THAT MIGHT BE BLOWN AWAY. STORE DRINKING WATER IN CLEAN CONTAINERS OR BATHTUBS. CHECK YOUR BATTERY-POWERED EQUIPMENT. KEEP AMPLE FUEL IN YOUR CAR SHOULD EVACUATION BE NECESSARY. LISTEN TO THIS STATION FOR ADVISORIES AND INSTRUCTIONS. THESE HURRICANE SAFETY TIPS ARE FROM



Federal Emergency Management Agency / National Oceanic and Atmospheric Administration - U.S. Department of Commerce

MEDIA

Radio Scripts

Preparing Your Home

:60 seconds

A HURRICANE WARNING MEANS YOU MAY HAVE TO ACT FAST. IF YOUR HOME IS STURDY AND ON HIGH GROUND, STAY THERE UNLESS ADVISED TO EVACUATE. LEAVE LOW-LYING AREAS THAT MAY BE SWEPT BY HIGH TIDES OR STORM WAVES, AND LEAVE MOBILE HOMES FOR STURDIER SHELTER.

BOARD UP WINDOWS AND DOORS OR PROTECT THEM WITH STORM SHUTTERS OR TAPE. MOVE VALUABLES TO UPPER FLOORS. TIE DOWN OR MOVE OUTDOOR OBJECTS THAT MIGHT BE BLOWN AWAY. BE CERTAIN YOUR EMERGENCY EQUIPMENT IS IN GOOD WORKING ORDER AND YOU HAVE ENOUGH SUPPLIES TO LAST SEVERAL SAYS. STORE DRINKING WATER IN CLEAN CONTAINERS OR BATHTUBS. STOCK CANNED GOODS OR NON-PERISHABLE FOODS. HAVE A PORTABLE RADIO AND FLASHLIGHT CLOSE AT HAND, AND STORE EXTRA BATTERIES. KEEP A FIRE EXTINGUISHER READY. AND KEEP AMPLE FUEL IN YOUR CAR SHOULD YOU HAVE TO EVACUATE. STAY TUNED TO THIS STATION FOR OFFICIAL BULLETINS AND ADVICE. THESE HURRICANE SAFETY TIPS ARE FROM

MEDIA Radio Scripts

Evacuation :10 seconds

WHEN A HURRICANE THREATENS, LISTEN FOR OFFICIAL INSTRUCTIONS AND BE READY TO LEAVE AT A MOMENT'S NOTICE. THIS HURRICANE SAFETY TIP IS FROM

Evacuation :30 seconds

IF A HURRICANE IS ON ITS WAY AND YOU'RE ADVISED TO EVACUATE,
DO SO IMMEDIATELY. ALWAYS FOLLOW THE ADVICE OF YOUR LOCAL
GOVERNMENT. LEAVE EARLY SO YOU WON'T BE TRAPPED IN YOUR HOME.
WHEN TOLD TO MOVE TO A CERTAIN LOCATION, GO THERE, AND NOWHERE
ELSE. IF SPECIFIC TRAVEL ROUTES ARE RECOMMENDED, USE THEM. KEEP
LISTENING TO THIS STATION FOR SAFETY INFORMATION. THESE
HURRICANE SAFETY TIPS ARE FROM



Federal Emergency Management Agency / National Oceanic and Atmospheric Administration - U.S. Department of Commerce

MEDIA

Radio Scripts

Evacuation

:60 seconds

IF A HURRICANE THREATENS AND YOU ARE ADVISED TO EVACUATE YOUR HOME TEMPORARILY, ALWAYS FOLLOW THE INSTRUCTIONS GIVEN BY YOUR LOCAL GOVERNMENT. IF YOU ARE ADVISED TO EVACUATE, DO SO PROMTPLY. IF YOU ARE TOLD TO MOVE TO A CERTAIN LOCATION, GO THERE . . . DON'T GO ANYWHERE ELSE. USE TRAVEL ROUTES THAT ARE SPECIFIED OR RECOMMENDED BY LOCAL AUTHORITIES, RATHER THAN TRYING TO FIND SHORTCUTS OF YOUR OWN. IT YOU ARE TOLD TO SHUT OFF YOUR WATER, GAS, OR ELECTRIC SERVICE BEFORE LEAVING, DO SO.

TRAVEL WITH CARE. IF YOU ARE DRIVING YOUR CAR TO ANOTHER LOCATION, LEAVE EARLY ENOUGH SO YOU WON'T BE MAROONED BY FLOODED ROADS AND FALLEN TREES AND WIRES. MAKE SURE YOU HAVE ENOUGH GAS IN YOUR CAR. AS YOU TRAVEL, KEEP LISTENING TO THIS STATION FOR ADDITIONAL INFORMATION AND INSTRUCTIONS FROM YOUR LOCAL GOVERNMENT. THESE HURRICANE SAFETY TIPS ARE FROM

MEDIA Radio Scripts

Driving in Severe Weather

:30 seconds

NEVER ATTEMPT TO DRIVE THROUGH FLOOD WATER. WATER CAN BE DEEPER THAN IT APPEARS, AND WATER LEVELS CAN RISE VERY QUICKLY. MOST CARS WILL FLOAT DANGEROUSLY FOR AT LEAST A SHORT WHILE, AND CAN BE SWEPT AWAY QUICKLY IN FLOODWATERS. IF YOUR CAR STALLS IN FLOODWATER, GET OUT IMMEDIATELY AND MOVE TO HIGHER GROUND. THESE HURRICANE SAFETY TIPS ARE FROM

Hurricane Driving Safety

:30 seconds

IF YOU EVACUATE TO ANOTHER LOCATION, KEEP THESE TIPS IN MIND: LEAVE AS SOON AS YOU ARE ADVISED TO EVACUATE TO AVOID CROWDED ROADS OR BEING TRAPPED BY FLOODED ROADS, FALLEN TREES, AND DOWNED WIRES. MAKE SURE YOU HAVE ENOUGH GAS IN YOUR CAR. FOLLOW RECOMMENDED ROUTES. AVOID COASTAL AND LOW-LYING ROADS. AND KEEP LISTENING TO THIS STATION FOR WEATHER UPDATES. THESE HURRICANE SAFETY TIPS ARE FROM

DISPLAY1 ITEM OC 944 .F293h

36668141030645 o12127560 QC 944 .F293h 1985

Corporate Author: United States. Federal Emergency Management Agency.

Title: Hurricane awareness workbook / [Federal Emergency

Management Agency and National Oceanic and Atmospheric

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Publication info: Washington, D.C.: Federal Emergency Management Agency,

[1985]

General Note: Cover title.

Held by: CHARLESCSC

Subject term: Hurricanes.

Subject term: Hurricane protection.

Added Author: United States. National Oceanic and Atmospheric

Administration.

(Displaying 1 of 1 volumes)

QC 944 .F293h 1985

copies:1

library: CHARLESCSC

copy:1

ID:36668141030645 BOOK (STACKS)

ORDERS: NONE



Federal Emergency Management Agency / National Oceanic and Atmospheric Administration - U.S. Department of Commerce

MEDIA

Radio Scripts

Tornadoes Spawned by Hurricanes

:10 seconds

TORNADOES ARE OFTEN SPAWNED BY HURRICANES. WHEN A HURRICANE IS ON ITS WAY, LISTEN FOR TORNADO WATCHES AND WARNINGS. THIS HURRICANE SAFETY TIP IS FROM

Tornadoes Spawned by Hurricanes

:30 seconds

TORNADOES SPAWNED BY HURRICANES ARE KILLERS. WHEN A HURRICANE IS ON ITS WAY, LISTEN FOR TORNADO WATCHES AND WARNINGS. A TORNADO WATCH MEANS CONDITIONS ARE RIGHT FOR A TORNADO. A WARNING MEANS A TORNADO HAS ACTUALLY BEEN SIGHTED. IMMEDIATELY SEEK SHELTER INSIDE, PREFERABLY BELOW GROUND LEVEL. DO NOT TRY TO ESCAPE BY CAR. IF THERE IS NO TIME TO GET INSIDE, LIE FLAT IN THE NEAREST DEPRESSION, LIKE A DITCH OR A RAVINE. THESE HURRICANE SAFETY TIPS ARE FROM

MEDIA Radio Scripts

After the Hurricane

:10 seconds

ALTHOUGH THE HURRICANE'S STORM HAS PASSED, STAY INDOORS UNTIL LOCAL AUTHORITIES SAY IT IS SAFE TO LEAVE. THIS HURRICANE SAFETY TIP IS FROM

After the Hurricane

:30 seconds

ALTHOUGH THE HURRICANE'S STORM HAS PASSED, THE DANGER IS NOT OVER. STAY INDOORS UNTIL LOCAL AUTHORITIES SAY IT IS SAFE TO LEAVE. STAY TUNED TO THIS STATION FOR INFORMATION ON WHERE TO GO FOR ASSISTANCE WITH HOUSING, CLOTHING, AND FOOD.

WHEN RETURNING HOME, STAY AWAY FROM RIVERS, FLOOD PLAINS, AND COASTAL AREAS UNTIL FLOODING IS NO LONGER A DANGER. KEEP OUT OF DISASTER AREAS WHEN POSSIBLE. THESE HURRICANE SAFETY TIPS ARE FROM



Federal Emergency Management Agency / National Oceanic and Atmospheric Administration - U.S. Department of Commerce

MEDIA

Radio Scripts

After the Hurricane

:60 seconds

THE HURRICANE HAS PASSED, BUT MANY DANGERS STILL EXIST.

REMAIN INDOORS UNTIL LOCAL AUTHORITIES SAY IT IS SAFE TO

LEAVE. KEEP TUNED TO THIS STATION FOR OFFICIAL INSTRUCTIONS

AND ADVICE ON WHERE TO GO FOR NECESSARY MEDICAL CARE AND

EMERGENCY ASSISTANCE FOR HOUSING, CLOTHING, AND FOOD, AND WAYS

TO HELP YOURSELF AND YOUR COMMUNITY RECOVER FROM THE EMERGENCY.

STAY AWAY FROM RIVERS, FLOOD PLAINS, OR COASTAL AREAS UNTIL ALL POTENTIAL FLOODING IS PAST. KEEP OUT OF DISASTER AREAS WHEN POSSIBLE. DO NOT DRIVE UNLESS YOU MUST. ROADS MAY BE UNDERMINED AND COLLAPSE UNDER THE WEIGHT OF A CAR. DRIVE CAREFULLY ALONG DEBRIS-FILLED STREETS. AVOID LOOSE OR DANGLING WIRES, AND REPORT THEM IMMEDIATELY TO YOUR POWER COMPANY OR TO THE LOCAL POLICE OR FIRE DEPARTMENT. REPORT BROKEN SEWER OR WATER MAINS TO THE WATER DEPARTMENT. CHECK REFRIGERATED FOOD FOR SPOILAGE IF POWER HAS BEEN OFF DURING THE STORM. THESE HURRICANE SAFETY TIPS ARE FROM

MEDIA Radio Scripts

Storm Surge :30 seconds

A HURRICANE STORM SURGE IS A DOME OF WATER OFTEN 50 MILES WIDE THAT SWEEPS AWAY EVERYTHING IN ITS PATH. THE STRONGER THE HURRICANE, THE HIGHER THE STORM SURGE WILL BE. NINE OUT OF TEN HURRICANE DEATHS ARE CAUSED BY THE STORM SURGE. DURING AND IMMEDIATELY AFTER A HURRICANE, AVOID THE COAST. THIS HURRICANE SAFETY TIP IS FROM

Inland Flooding

:10 seconds

INLAND FLOODING CAUSED BY A HURRICANE IS A DANGEROUS KILLER.

AVOID LOW-LYING AREAS AND WATERWAYS DURING AND AFTER A

HURRICANE. THIS HURRICANE SAFETY TIP IS FROM

Inland Flooding

:30 seconds

HURRICANES CAN CAUSE EXTENSIVE FLOODING, NOT JUST ALONG THE COAST BUT FAR INLAND AS WELL. IF YOU LIVE INLAND FROM A HURRICANE-PRONE COAST, STAY AWARE OF WEATHER CONDITIONS. KNOW WHERE THE HIGH GROUND IS AND HOW TO GET THERE IN A HURRY. STAY AWAY FROM LOW-LYING AREAS. THIS HURRICANE SAFETY TIP IS FROM . .

. .

Article



Federal Emergency Management Agency / National Oceanic and Atmospheric Administration - U.S. Department of Commerce

MEDIA

Article

Entering the Hurricane Season

June to November

Being prepared for the Hurricane Season can make a significant difference in your ability to cope with these violent storms. Each community in a hurricane region may have overall plans to combat this menace, but individuals, too, need to be cautious and prepare for threats to their safety. Remember, because hurricanes are so unpredictable in their destructive capabilities, you might have to rely on yourself for a period of time during one of these storms.

A hurricane begins as a tropical storm somewhere over the ocean. Rotating in a circular pattern, the storm quickly picks up speed and momentum, reaching wind-speeds of 74mph and is thus labeled a full-force hurricane. While the strong winds and heavy rains of a hurricane can pose a threat to human life and property, the most dangerous element of a hurricane is the storm surge. As the storm moves across coastal areas, tides of three to ten feet above normal are common occurrences. In some cases, surging tides may rise over 20 feet and flood low-lying inland areas.

MEDIA Article

It is never too early to set aside the supplies you would need during a hurricane emergency. People traditionally stock supplies such as extra medication or an extra pair of glasses for emergency situations. A hurricane emergency is no less important, and special precautions or preparations should be made for your protection.

The Federal Emergency Management Agency and the National Weather Service suggest that a list of hurricane preparation supplies should include several days supply of drinking water and non-perishable food, a first-aid kit, a fire extinguisher, a battery-powered radio, flashlights, and extra batteries.

If you live in a coastal area, have a safe evacuation route planned. Your community's hurricane preparedness plan should include designated safe areas, areas to be evacuated during a hurricane emergency, and safe evacuation routes to shelter.

Information on evacuation planning in your area can be obtained by contacting your local civil defense or emergency services office.



Federal Emergency Management Agency / National Oceanic and Atmospheric Administration - U.S. Department of Commerce

MEDIA

<u>Article</u>

Knowing Hurricane Alerts

Thanks to modern detection and tracking devices, the National Weather Service can usually give 12 to 24 hours of warning of an impending hurricane landfall.

A HURRICANE WATCH is issued when a hurricane becomes a threat to coastal areas. Everyone in the area covered by the watch should listen for further advisories and be prepared to act promptly if advised to do so.

A HURRICANE WARNING indicates that hurricane winds of 74 miles an hour or higher, or a combination of dangerously high water and very rough seas, are expected in a specific coastal area within 24 hours. Safety actions should begin immediately.

The National Weather Service issues hurricane probabilities as part of its official advisories as a hurricane approaches the U.S. Such probabilities (expressed as percentages) are issued four times a day and are used by your local government officials to make emergency decisions and give you emergency preparedness instructions. The probabilities are defined as the chance (in percent) that the center of the storm will pass within approximately 65 miles of 44 selected locations from Brownsville, Texas, to Eastport, Maine.

MEDIA <u>Article</u>

As a hurricane approaches the U.S., you may be informed of these probabilities over television, radio, or in the newspaper. As a hurricane moves toward land, a probability percentage is assigned to several points along the coastline. If the percentage increases with each advisory, listen carefully to your local radio and television stations for emergency instructions. Ready your household and be prepared to evacuate if advised to do so.

Hurricanes can cause extensive flooding--not just along the coastline, but far inland as well. Flood insurance is valuable financial protection for your property. You should be aware, however, that homeowners policies rarely cover damage from flooding. Check into the availability of flood insurance to protect your property by contacting your insurance agent or broker. Several insurance companies now underwrite "flood policies" in cooperation with the National Flood Insurance Program, administered by the Federal Emergency Management Agency.



Federal Emergency Management Agency / National Oceanic and Atmospheric Administration - U.S. Department of Commerce

MEDIA

Article

Preparing for a Hurricane

If a hurricane threatens, keep listening to your local radio or television station for the latest Weather Service advisories as well as special instructions from local government officials. The first rule to remember is that when you are advised to evacuate—do so immediately. Evacuation is always an option, but it is a life—saving means of protecting yourself and your family.

Be familiar with your community's evacuation plan procedures—what route you will take to go to designated safe areas. Fill your car's fuel tank to be prepared in case evacuation should be necessary. There is always the possibility that service stations may be inoperable after a storm strikes.

Residents of low-lying areas that may be swept by high tides or storm waves should evacuate such areas without delay. It would be extremely dangerous to be caught in your car on an open coastal road. Roads to safer areas could become flooded before the full force of the hurricane strikes, and getting out of such areas could be further complicated by the fact that the density of population in some areas makes it mathematically impossible for the few roads to accommodate everyone within one day.

MEDIA <u>Article</u>

If your local government advises evacuation of your area, DO SO IMMEDIATELY. Do not wait to see "what develops." Keep your car radio on to listen for further instructions, such as the location of emergency shelters.

If you live inland, away from the beaches and low-lying coastal areas, your home is well constructed, and local authorities have not called for evacuation in your area, stay home and make emergency preparations.

Hurricanes can cause power and water failure. Make sure battery-powered equipment such as radios and flashlights are in good operating condition. Your battery radio could be your only source of information in a hurricane emergency. Store a supply of drinking water in clean bathtubs, jugs, bottles, and cooking utensils because your normal water system may be contaminated or damaged by the storm.

Board up windows or protect them with storm shutters or tape. Danger to small windows is mainly the result of wind-driven debris. Larger windows may be broken by wind pressure. Although tape may not keep a window from breaking, it is an effective way of preventing flying glass.



Federal Emergency Management Agency / National Oceanic and Atmospheric Administration - U.S. Department of Commerce

MEDIA

Article

Secure outdoor objects that might be blown away. Garbage cans, garden tools, toys, signs, porch furniture, and a number of other harmless items can become weapons in hurricane winds. Boats should be moored securely, or moved to a designated safe area before the storm arrives.

As you monitor Weather Service advisories, be alert for tornado watches or warnings. Tornadoes are often spawned by hurricanes. Should your area receive a tornado warning, seek inside shelter immediately, preferably below ground level.

When the storm arrives, STAY IN YOUR HOUSE, until you have been advised that the storm has passed. Travel is extremely dangerous. Be especially wary of the "eye" of the hurricane. If the storm center passes directly overhead, there will be a lull in the wind lasting from a few minutes to half-an-hour or more. Because a hurricane is a rotating storm, at the other side of the "eye", winds will increase rapidly to hurricane force and will come from the opposite direction of the initial wind impact.

MEDIA <u>Article</u>

After the Hurricane Has Passed

If a hurricane forces you into a public shelter, remain there until informed by local officials that it is safe to return to your home.

Keep tuned to your local radio or television station for advice and instructions about emergency medical, food, housing, and other forms of assistance.

Do not drive unless you must. Debris-filled streets are dangerous and roads should be clear for emergency vehicles--you might interfere with essential rescue and recovery work.

Additionally, along the coast, soil may be washed from beneath the pavement, which could collapse under the weight of a car.

Avoid loose or dangling wires, and report them to your local power company, local police, or fire department. Also, report any broken sewer or water mains. Be particularly careful to prevent the outbreak of fire, as lowered water pressure may make fire fighting difficult.

Hurricanes moving inland can cause severe flooding. Stay away from river banks and streams until all potential flooding is past.



Federal Emergency Management Agency / National Oceanic and Atmospheric Administration - U.S. Department of Commerce

MEDIA

Article

Be suspicious of water which may have become contaminated. If the power has been off, check refrigerated food for spoilage. Once a freezer is without power, it should keep food in satisfactory condition up to 36 hours provided it is kept closed. Wrapping the freezer in blankets will help insulate the cold.

Hurricane Preparedness is for Everyone

Discuss the information in this article with your children. Explain your family's plans and preparations. Share your ideas with friends, neighbors, and relatives. Hurricane preparedness is a job for everyone in the community.

Additional information on hurricane preparedness is available at the local civil defense or emergency service office at _____(address)_____.

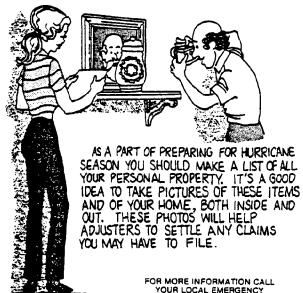
NOTE: Those paragraphs that are bracketed are especially adaptable for inserting information such as evacuation maps, addresses or phone numbers, or other information that is pertinent to your local emergency response programs or agencies.

"Did You Know" Cartoons

DID YOU KNOW?



DID YOU KNOW ?



YOUR LOCAL EMERGENCY MANAGEMENT OFFICE.

DID YOU KNOW ?

LOCAL EMERGENCY MANAGEMENT OFFICE.



CHECK INTO THE AVAILABILITY OF FLOOD INSURANCE THROUGH THE NATIONAL FLOOD INSURANCE PROGRAM BY CONTACTING YOUR LOCAL INSURANCE AGENT OR BROKER.

FOR MORE INFORMATION CALL YOUR LOCAL EMERGENCY MANAGEMENT OFFICE.

DID YOU KNOW ?



AVOID ALREADY FLOODED AREAS. DO NOT ATTEMPT TO CROSS ANY STRETCH OF FLOOD WATER IF THE WATER IS ABO CROSS ANY STRETCH IF THE WATER IS ABOVE YOUR KNEES.

FOR MORE INFORMATION CALL YOUR LOCAL EMERGENCY MANAGEMENT OFFICE.

DID YOU KNOW ?

YOUR ANNUAL PREPARATIONS FOR HURRICANE SEASON SHOULD INCLUDE CHECKING TO SEE THAT YOU HAVE A SUPPLY OF NON-PERISHABLE FOOD, FIRST AID SUPPLIES,



DID YOU KNOW?

IT IS WISE TO LEAVE EARLY FROM LOW-LYING AREAS WHICH COULD BE SWEPT BY HIGH TIDES OR STORM WAVES BEFORE AND DURING A HURRICANE.



FOR MORE INFORMATION CALL YOUR LOCAL EMERGENCY MANAGEMENT OFFICE.

DID YOU KNOW ?

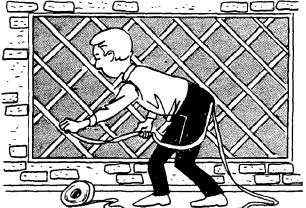
YOU SHOULD LEARN THE SAFEST ROUTE FROM YOUR HOME OR PLACE OF BUSINESS TO HIGH, SAFE GROUND BEFORE A HURRICANE OCCURS.



YOU SHOULD PRACTICE TAKING THESE ROUTES BEFOREHAND. IF A HURRICANE PRODUCES FLOODING, YOU MAY ONLY HAVE MINUTES TO GET TO SAFETY.

FOR MORE INFORMATION CALL YOUR LOCAL EMERGENCY MANAGEMENT OFFICE.

DID YOU KNOW?



IF A HURRICANE IS ON ITS WAY, YOU SHOULD BOARD UP WINDOWS OR PROTECT THEM WITH STORM SHUTTERS OR TAPE. LARGER WINDOWS MAY BE BROKEN BY WIND PRESSURE AND ALL WINDOWS MAY BE SHATTERED BY FLYING DEBRIS. TAPE IS AN EFFECTIVE WAY OF PREVENTING FLYING GLASS.

FOR MORE INFORMATION CALL YOUR LOCAL EMERGENCY MANAGEMENT OFFICE.

DID YOU KNOW?



FOR MORE INFORMATION CALL YOUR LOCAL EMPRICENCY MANAGEMENT OFFICE

DID YOU KNOW ?



DID YOU KNOW?



VOUR HOMEOMARE'S POLICY DOES

NOT COME DAMAGE FROM FLOODING
CHECK INTO THE AMALLABILITY OF FLOOD INSURANCE
HARDLEN THE NATIONAL FLOOD INSURANCE
CONTACTING YOUR LOCAL INSURANCE AGENT OR BROKER.

FOR MORE INFORMATION CALL YOUR LOCAL FMERGENCY MANAGEMENT OFFICE

DID YOU KNOW ?



AVOID ALREADY FLOODED AREAS, DO NOT ATTEMPT TO CROSS ANY STRETCH OF FLOOD WATER IF THE WATER IS ABOVE YOUR KNEES. FOR MORE INFORMATION CALL YOUR LOCAL EMERGENCY MANAGEMENT OFFICE

DID YOU KNOW?

PREPARATIONS FOR HURRICANE SEASON IDE CHECKING TO SEE THAT YOU HAVE A NOT PERISHABLE FOOD, FOST AND SUPPLIES, FIRE EXTINGUISHER BATTERY POWERED RADIO, FLASHLIGHT AND BATTERIES



DID YOU KNOW?

IS WISE TO LEAVE EARLY FROM LYING AREAS WHICH COULD BE SWEPT IGH TIDES OR STORM WAVES BEFORE DURING A HURRICANE.



DID YOU KNOW?

YOU SHOULD LEARN THE SAFEST ROUTE FROM YOUR HOME OR PLACE OF BUSINESS TO HIGH, SAFE GROUND BEFORE A HURRCANE OCCURS



YOU SHOULD PRACTICE TAKING THESE ROUTES BEFOREHAND. IF A HURRICANE PRODUCES FLOODING, YOU MAY ONLY HAVE MINUTES TO GET TO SAFETY.

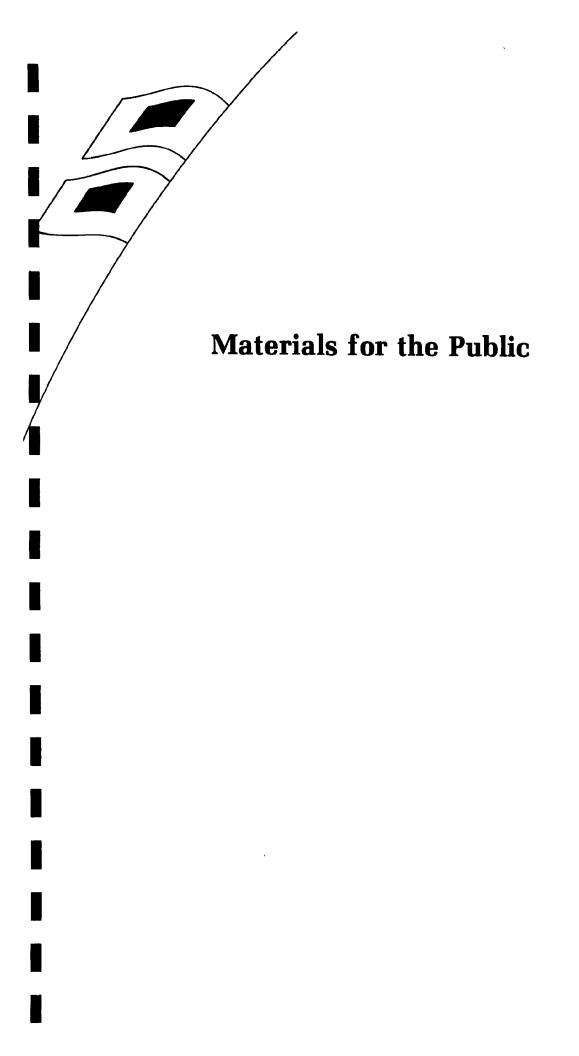
FOR MORE INFORMATION CALL YOUR LOCAL EMERGENCY MANAGEMENT OF FICE

DID YOU KNOW?

TOR MORE INFORMATION CALL YOUR LINEAR



IF A HURRICANE IS ON ITS WAY, YOU SHOULD BOARD
UP WINDOWS OR PROTECT THEM MITH STORM.
SHUTTERS OF TAPE LARGER WINDOWS MAY BE
BROKEN BY WIND PESSUIRE AND ALL WINDOWS MAY
BE SHATTERED BY FLYING DERRIS TAPE IS AN
EFFECTIVE WAY OF PREVENTING FLYING GLASS



that may be swept by high tides or storm waves. Leave mobile homes for more substan-LEAVE EARLY from low-lying beach areas tial shelter - they are particularly vulnerable to overturning in strong winds.

it mathematically impossible for the few roads to accomodate everyone within one day. Don't get caught by the hurricane in your car on an BE AWARE that some areas may flood long may be further complicated by the fact that the density of population of some areas makes before the arrival of the storm. Your escape open coastal road.

your area, DO SO IMMEDIATELY. Keep your car radio on to listen for further instructions, such as the location of emergency shelters. If local government advises evacuation of

low-lying coastal areas, your home is well construct-ed, and local authorities have not called for evacua-tion in your area, stay home and make emergency If you live inland away from the beaches and preparations.

■ Be alert for tornado watches and warnings as tornadoes are often spawned by hurricanes. Should your area receive a tornado warning, seek inside shelter immediately, preferably below ground level.

During the hurricane

Remain indoors during the hurricane. Blowing cane. If the storm center passes directly overhead, there will be a lull in the wind lasting from a few minutes to half-an-hour or more. At the other side of the "eye" the winds will increase rapidly to hurrious. Be especially wary of the "eye" of the hurricane force, and will come from the opposite direcdebris can injure and kill. Travel is extremely danger

After the hurricane has passed

If you are in a public shelter, remain there until informed by those in charge that it is safe to leave.

tion for advice and instructions from local government about emergency medical, food, housing, and Keep tuned to your local radio or television staother forms of assistance.

ous and where your presence will interfere with Stay out of disaster areas which could be dangeressential rescue and recovery work.

Do not drive unless you must. Roads should be left clear for emergency vehicles and debris filled streets are dangerous. Along the coast, soil may be washed from beneath the pavement, which could collapse under the weight of a car.

Avoid loose or dangling wires, and report them immediately to your power company or local police or fire department.

Report broken sewer or water mains to the water

Prevent fires. Lowered water pressure may make fire fighting difficult. department.

ing. Stay away from river banks and streams until all Hurricanes moving inland can cause severe floodpotential flooding is past.

If power has been off, check refrigerated food for spoilage. Be suspicious of water that may have been

ricane emaigency the subject of a family discussion. Share your family's blans with friends and relatives. Hurricane preparedness is a lean effort for everyone in the neighborhood and Make your plans and preparations for a hur contaminated.

Federal Emergency Management Agency Washington, D.C. 20472



L-105

safety tips for

For those who haven't felt the force of a hurricane

As the hurricane approached the beautiful saucer-deep bay, long-time residents sat on their patios and sipped tall drinks. The last hurricane was only a dim 22-year old memory. The storms broke their once-every-six-year average of hitting the coast long ago. When they did hit, it never amounted to more than a splash of water blown up to the property lines or porch steps. Evacuate in response to civil defense sirens and radio warnings? Why bother? They were having too much fun! It was pleasant - a breezy Indian Summer Sunday evening.

should include checking to see that you have a supply of non-perishable food, first aid kit, fire extinguisher,

battery-powered radio, flashlights, and extra bat-

teries.

Your annual preparations for the hurricane season

their homes splinter by splinter, as they cowered in But by morning the bridge was out. They were stuck. Record 200 mile per hour plus winds shredded upper floor back bedrooms, clinging to mattresses.

to 24 hours of advance warning. Advisories are issued by the Weather Service of NOAA when hurricanes

approach land.

the National Weather Service can usually provide 12

Thanks to modern detection and tracking devices,

Advisories and warnings

cane becomes a threat to coastal areas. Everyone in the area covered by the "watch" should listen for further advisories and be prepared to act promptly if

a hurricane warning is issued.

A "hurricane watch" is issued whenever a hurri-

its giant wind-driven waves over 20 feet high, strewing devastation, and finishing what the wind had Those alive tried to concentrate on shutterless flashbacks of their lives as they waited in terror for the end. Then a mighty storm surge plowed inland, started.

This could happen to you.

Enter the season prepared

If you live in a coastal area, plan a flood-free evacuation route. Your community's hurricane preparedness plan should include designated safe areas, areas to be evacuated during a hurricane emergency, and safe evacuation routes to shelter. Get information on emergency planning in your area by contacting your local civil defense or emergency services Hurricanes can cause extensive flooding, not just along the coastline, but far inland as well. Flood in-

Getting ready for the hurricane

Keep tuned to a local radio or television station for the latest Weather Service advisories as well as special instructions from local government.

be aware, however, that your homeowners' policy does not cover damage from flooding. Check into the

availability of flood insurance through the National

Flood Insurance Program by contacting your local

insurance agent or broker,

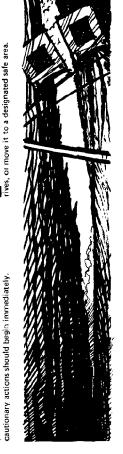
surance is valuable financial protection. You should

- Check battery-powered equipment. Your battery-operated radio could be your only source of information, and flashlights will be needed if utility services are interrupted.
- your car fueled should evacuation be Also, service stations may be inoperable your car fueled should after the storm strikes. Keep necessary.
- bottles, and cooking utensils as your town's water system may be contaminated or damaged by the Store drinking water in clean bathtubs, jugs,
- Board up windows or protect them with storm from wind-driven debris. Larger windows may be broken by wind pressure. Although tape may not shutters or tape. Danger to small windows is mainly keep a window from breaking, it is an effective way of preventing flying glass.
- away. Garbage cans, garden tools, toys, signs, porch Secure outdoor objects that might be blown furniture, and a number of other harmless items become deadly missiles in hurricane winds.

A "hurricane warning" is issued when hurricane winds of 74 miles an hour or higher, or a combination of dangerously high water and very rough seas, are ex-

pected in a specific coastal area within 24 hours. Pre-

Moor your boat securely before the storm ar-Moor your boar secure, rives, or move it to a designated safe area.







heights, with giant wind-driven waves and strong, unpredictable currents. These are the storm's worst killer. A hurricane causes sea level to rise above normal tidal

- M Know your property's elevation above mean sea level.
 - Have a safe evacuation route planned.
- # Learn the storm surge history for your area.

extremely dangerous. When a hurricane approaches, listen for tornado watches and warnings, and be ready to take im-Tornadoes spawned by hurricanes are mediate shelter.

National Oceanic and Atmospheric Administration. U.S. DEPARTMENT OF COMMERCE



For sale by the Superintendent of Documenta, U.S. Oeverument Printing Office For sale by the Superintendent of D.C. 20402

Enter the June-November season prepared. Inventory boards, tools, batteries, nonperishable foods, and other emergency

When your area receives a hurricane warning: equipment.

- Leave low-lying areas.
- Moor your boat securely or evacuate it.
- Protect your windows with boards, shutters, or tape.
 - Secure outdoor objects or bring them indoors.
- Fuel your car.
- Save several days' water supply.
- Stay at home if it is sturdy and on high ground.
- Leave mobile homes for more substantial shelter.
 - Stay indoors during the hurricane.

HURRICANE WATCH: Hurricane conditions pose a possible

threat to your area.

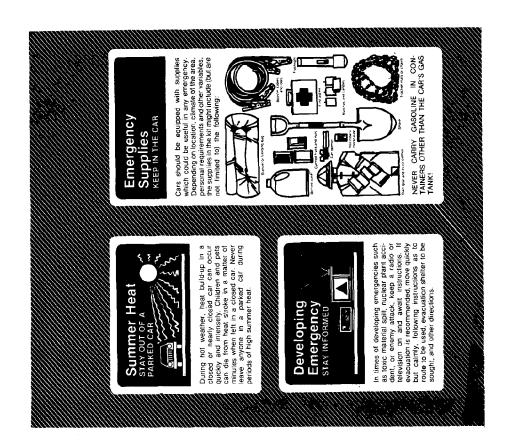
In especially vulnerable areas, early evacuation may be necessary when a Watch is issued. Otherwise you should review hurricane safety procedures and make preparations. Listen to NOAA Weather Radio and commercial radio and television for the latest information and instructions for your location.

HURRICANE WARNING: Hurricane conditions are expected in your area within 24 hours.

Areas subject to storm surge or tides should be evacuated as well as areas which could be isolated by flood waters. Follow the instructions of local officials. You will not be asked to leave your home unless your life is threatened.

REMEMBER: Latest storm-related information will be available on NOAA Weather Radio and commercial radio and television. Do not tie up telephone lines by calling local officials or the National Weather Service. Listen carefully to broadcasters serving your immediate area.





For motorists in emergencies in emergencies in emergencies Earthquake Earthqu



Americans are world-lamous for their long-term love affair with the automobile. In limes of emergancy, however, people often react incorrectly, either saying with or abandoning their cars at the wrong time.

After almost every disaster, search and rescue teams find victims who might have survived if they had known whether to stay with or leave their cars. A mistake can be fatal.

Following are safety tips for drivers in various types of emergencies. This information should be kept in the glove compartment of your car. In any situation, the most important rule is: Don't pantic.



Bring the car to a halt as soon as safely possible, then remain in the car until the shaking has stopped. The car's suspension system will make the car shake violently during the qualek. Dut it is still a sale pace to be. Avoid stopping near or under buildings, overpasses and utility wires. When the quaking hard stopping pages and otter elevated structures which might have been damaged by the quake and could be damaged by the systems of the could be damaged by the quake and could be damaged by the systems of the could be damaged by the quake and the page of the page



recoving call organ was recover a function the rest land. Plan to evacuate early, and keep a full lank of gas during the hurfrcane season. Learn the best evacuation route before a storm forms, and make arrangements with triends or relatives inland to stay with them until the storm has passed. Never atternot to drive curing a hurricane or until the all-clear is given after the storm. Plass in locating can occur after a hurricane has passed. Avoid driving on coastal and overlying roads. Storm surge and hurricane-caused flooding are ertailing and may occur with little or no warning. Flooding can begin well before a hurricane

LISTEN to radio or television for the fatest National Weather Service bulletins on severe weather for the area in which you will drive.



Never attempt to drive through water on a road Water can be deeper than it appears, and water levels can rise very quickly. Most cars will float dangerously for at least a short while. A car can be buoyed by floodwaters and then swept downstream during a flood. Procokvalers also can erode road. ways, and a missing section of road—even a missing bridge—will not be visible with water running over the area. Wade through toodwaters only if the water is not flowing rapidly and only in water no higher than the knees. If a cas stalls in floodwater, get out quickly and move to higher ground. The floodwaters may still be rising, and the car could be swept away at any moment.



tomado. When a warning is issued, do not to lo loave the area by car. I you are in a car, leave it and find shelter in a building. It a tomado approaches and there are no sale structures nearby, lie flat in a ditch or other ground depression with your arms over your head. A car is the least safe place to be during a



and and rescue to the state of the set when a read the set when a Avoid driving in severe winter storms. If you are caught in a storm and your car becomes immobilized, stay in the vehicle and awali rescue. Do not attempt to walk

HURRICANES

With burierans no relatively none center at any floration. Constal residents from Streament of the International Constal residents from Streament of International Properties and Properties of the International Constal Cons

Stated very simply hurricants are glant which with the works in wholf all moves in its large uppraining vicinity in which is a large uppraining restrict part experience of the state of th Huricanes are tropical cyclones in which winds most constant seeds of Thies per hour or mose, and blow in a large staint around a relatively call month—the eye of the huricane. Every year, these violent storms bring distruction to coastilines and islands in their erratic path.

weights of the age of the age of the agent, the weights to businesses. Here weight and light and detection, to perity clouds, that this calls is deceptive, bordered as it is by maximum force where and breated attain, they persons have been killed or injured when the calls ope lured here cut of abolitic, only to be caught in the maximum winds at the its adds or the eye, where in the weight place in a did not be a first in add or in the election to the eye, where in the leading half the agent agents.

Huricians which do much damage, but drowning the greatest Lause of hurician electric shaft in the greatest Lause of hurician electric shaft be some many reach. 25 test or more above normal. The may come rapidy, located oceast locations. Waves and currents erote beaches and barrier with the many come above normal. The wash out individual sections succeed the secondary and burriers with out individual secondary in futures and with wind result of the scompany the huricians produce success for the continue of the secondary and hurician produces and accompany infant mayors alled the winder for the secondary in the structure of the secondary in the secondary the huricians produced the huricians for the winder disminish, staff ill floods conditive the hurican's greatest financial.

the hurricans that title the assisten United States are born in the thosical and addednging Month Milliam Markey the Month Milliam States the County Month of Month o

The principal regions of trapical opcione origin array during his easien, Mack carly May and burn, saving during his easien, Mack carly May and burn, and array during the area of man frequent origin with transferd, and by Saptember are located over the larger, easier from the Bartens southerstand to the Lesser Anillies, and thence easiered to south of the Carlos Yerde Islands, near the west coast of Africa. After mid-Saptember, the principal sees of origin shall back to the western Santobean and Culf of Marco.

On average, six Atlantic hurricanes occur per two. However, free are spinificant deviations from this average. In 1516 and 1950, 11 hurri-tions were observed, and no huricanes vera characteristics of 1907 and 1914. During 1833, 1930, observed. In 1907 and 1914. During 1833, 1930, in progress at the same time.

Some hurricanes (usually weaker than their Atlantic counterparts) may sinke Southern Callifornia and bring forrential rains to the southwest U.S.

Hunteare begin as relatively small topical cy-closes which vinit gradually to the westernth-west (in the Northern Hemisphele), inhededor in westkerd-benning, inselevate, or beneford Under vertain conditions his med distorbances in the creas in its xi. speci, and mensity until they become ultilledged hunteares.

the atoms more lowed very allow, in the loopics, and may amain almost stationary for which periode of them. The initial increast speed is usually 15 miles per hour or less. Then, as the lowest peed tends to increase, at middle list! forward speed tends to increase, at middle list! class! In may exceed 50 miles per hour in extreme cases.

The great storms are driven by the heat released to condensing water vapor, and by external merchanical forces. Once out off from the warm coen, the storm begins to die, starved for water and meter energy, and dragged apar by friction as in every over the land.

U.S. DEPARTMENT OF COMMERCE National Oceanic and Atmospheric Administration National Weather Service

JULY 1982

NOAA/PA 78019

HURRICANE SURGE AND STORM

L 140 / June 1984



With North Atlantic

SAFETY

Tracking Chart



Θ . •

STORM

SURGE

FLOODS

The storm surge is a great dome of water ords of miles wide, that connex sweeping across the cossiline near the area where the surge, aided by the harmening effect of breaking wees, as talk the a gant buildozer sweeping seruphing in its path. The storage the harms and the higher the along will be. This is unquestionably the most danger in the factors to the factors of the harms with the storage to the harms which the storage to the harms with the storage brighter and and the factor of the harms will be a factor of the harms of the h

Pass Christian in Mississippi. Lesser heights are more usual but still extremely dangerous.

Many factors are involved in the formation and propagation of a storm surge each as the strength of the storm, bottom conditions where the surge comes ashore, and the bostition of the storm center in relation to the storm center in relation to the representative of all surges for all coastal areas. The augre displanment here in those produced by a burrier or approaching the lower-fulunition of full coastal areas.



ij

12 HOURS BEFORE PEAK SURGE

An Auritories may opens a serior most to the based-ers and the Witch has been changed to a function of the serior of the serior of the base is a till to their present in the serior of the base occur and beautiful to warm moves further up the count and beautiful serior—come as fully as five to the first—cream which may not make the pre-tain the serior of the serior of the serior of the The wind is picking up.

It is a normal basch day. The use rises and falls pre-dictably with actonomical lides series. There are the usual ensali werea. A hurricase has deviceded and a Hurricane Watch is in effect for the area.

NORMAL TIDE - HIGH



front property will be unable to withstand this combined essault of wind and water. The combination of storm surge, battering waves, and high tide is the hurdcane's most deadly hither.

The furnicions is moving afters close to the best users. In the furnicions is moving afters close to the best as a 15-cost using added to the normal factor attornational control of the centre of the cost of the factor of the factor is the goal is moved or water, topped by bathring waters, is moving along the movine doing move and considers to the form of the factor of the facto

killed 200 persons and cost an estimated XTO million in damage. In 1927, Agues fused with another storm system, flooding creek and river basen in the Merhaest with more than a foot of tain in loss than 12 hours, kill in 117 people and causing anions; 35 billion damage. Hurricane Bellan of 1987, brought major floods to southern Texas killing 10 persons and causing millions of dollars damage. The floods and flash floods brought by the coronalist arise of a functional are dusperous killers. Even though functions weeker rap-lights step more flash, the permants of the sorm can bring 5 to 12 inches of rain or more form can bring 5 to 12 inches of rain or more form as bring 5 to 12 inches of rain or more to the area it crosses. The resulting flood have caused great damage and ross of life having suborded it 50 ordinary to a fine as it moved into the conferent flood to 9 and shirants suborded, it brought floods to 9 and syriants, New York, and New England that





MINDS

The winds of a hurricane—by definition 74 mins an hour or none-can be very diaget our for some students, wind respectively sufficient to cause destruction. Motifs fromes are particularly uturerable to hurricane winds. Come hurricanes spawn forms contribute to incredible destruction.

The greatest threat from a hurricane's winds is their cargo of debris—a deadly barrage of lipting missiles such as lawn furniture, signs, roofing, and metal siding.





TERMS TO KNOW

By international agreement, tropical cyclone is the general term for all cyclone circulations originating over tropical waters, classified by form and intensity as follows:

Storm Warnings may be issued when winds of 55-73 miles en hour (48-63 knots) are expected. If a hurricane is expected to strike a coastal area, gale or storm warnings will not usually precede hurricane warnings. A Nurricane Watch is issued for a coastal area when there is a threat of hurricane conditions within 24-36 hours.

Tropical disturbance: A moving area of flunder-stroms in the Tropics that maintains its identity for 24-hours or more. A common phenomenon in the tropics.

Tropical depression: Rotary circulation at surface, highest constant wind speed 38 miles per hour (33 knots).

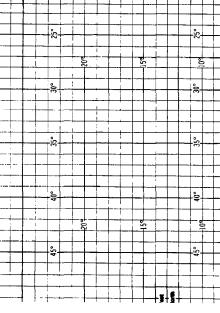
Tropical storm: Distinct rotary circulation, constant wind speed ranges 39-73 miles per hour (34-63 knots). Hurricana: Pronounced rotary circulation, con-stant wind speed of 74 miles per hours (64 knots) or more.

Small craft cautionary statements, When a tropical cycle of cyclone threatens a costala area, small craft operators are advised to remain in port or not to venture into the open sea.

Tornadosa spawned by hurricanes sometimes produce severe demage and casualties. If a tornado is reported in your area, a warning will be issued.







Wood small craft or more to safe shelter
Notice to primere provision; ease and drugs
Check between for and and itsellights
Check statemen for and and itsellights
and one shelter is to see the second or a secure lawn furnitue and other loose material
undoors a Table. Dotte if a shutter windows to prevent
shaltering
Wodges sided glass doors to prevent their lifting from their tracks. Here is a list of the many things to consider be-fore, during and after a hurricane. Some of the steety rutes will make things esself or you during a a hurricane. All are important and could help save your life and the lives of others.

Stay or Leave?

When a Hurricane Warning is lesued for Your Area

In general:

• Stayed furning to radio, TV or NOAA Weather Sayed furning that buildings and Saye from that buildings and Saye from that buildings and social socia

When a Hurricane Watch is issued for Your Area

Fuel car Check mobile home tie-downs

COMMUNITY ACTION

Beyoof includes and sharp selecte during a furitative energency, there is much to be done at the community there is much to be with the white on the Allantic and Gulf coasts have mides on the Allantic and Gulf coasts have the Allantic and Gulf coasts have been selected. The properties of the coast process of the coast of the coa

welled for dissaler's accentive lesson before station community. Personal station correctives steps, 20 Modelse Senice has invented a torn, same Homsport, and made it a model of huntrame preparedness.

Copies of The Homeport story are available from Superintendent of Documents, U.S. Government Printing Office, Washington, D.C., 2040C. Stock in number 0317-0048. Ask G.P.O. for current price.

CHECKLIST ACTION

When a hurrore threates you will have a hurrore threates to make the decision whether you tan indo out the storm in stelly a home in whether you can ride out the storm in stelly a home. The present a seconment of execution, you should seek! Their advice is based on knowledge that storage for the storage on the storage of the storage o

A Humicane Warning is issued when humicane conditions are expected in specified chastal set at 7 hours of 24 miles. Humicane conditions for the set of 7 miles an hour (64 knots) and 7 miles an hour (64 knots) and 70 designously high tides and weeks Actions and 70 receiptor (1) is and propercy and the file and propercy should begin immediately when 10e warning is issued.

Flash Flood Watch means a flash flood is possible in the area; stay alert. Flash Flood Warning means a flash flood is imminent; take immediate action.

et irou ive on the coasiline or ofsthore islands, particulares or mobile home plans fesses.

If you live in a mobile home plans fesses.

If you live in a fixed plan fesses of the fesse

At Beginning of Hurricane Sesson (June) Make Plans for Action

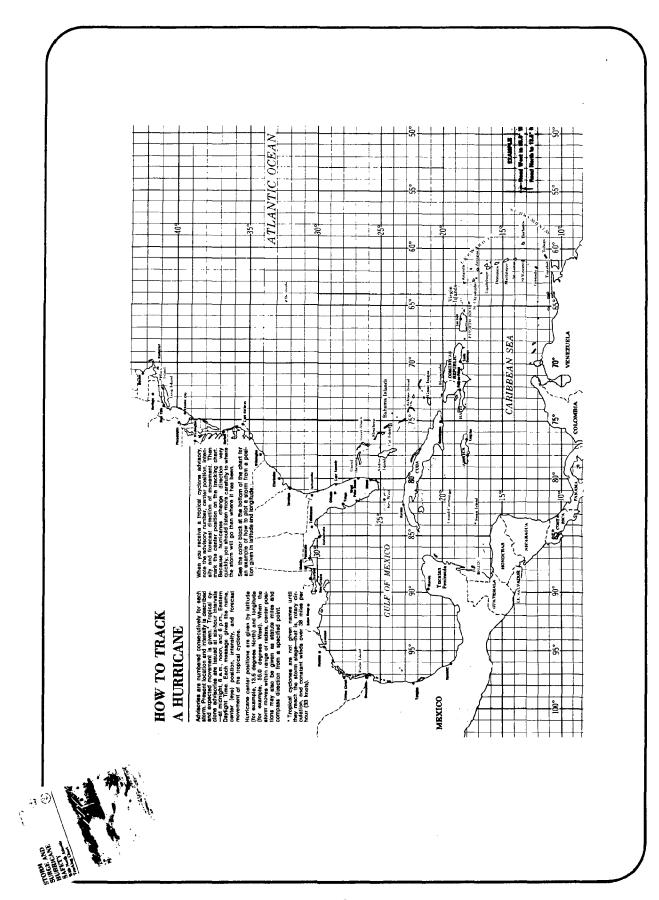
of four the storm surge history and elevation of four test rears had counts friend — team size counts friend — bears location of official shelters — bears location of official shelters — of bears may awke to move your beat in an emergency — frim back dead wood from less of she who of the counts in familiars and down appures to cover gives.

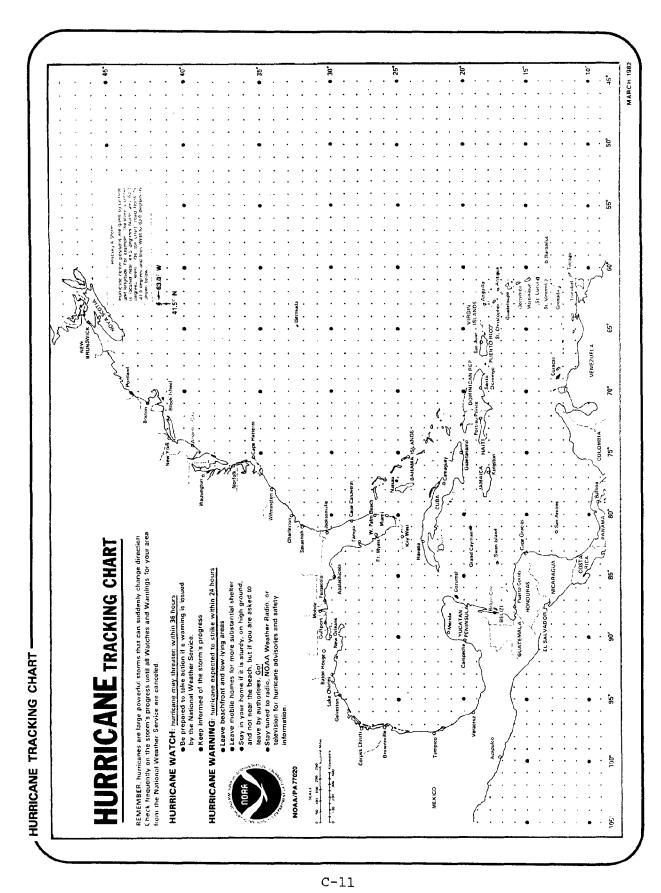
After the All-Clear is Given

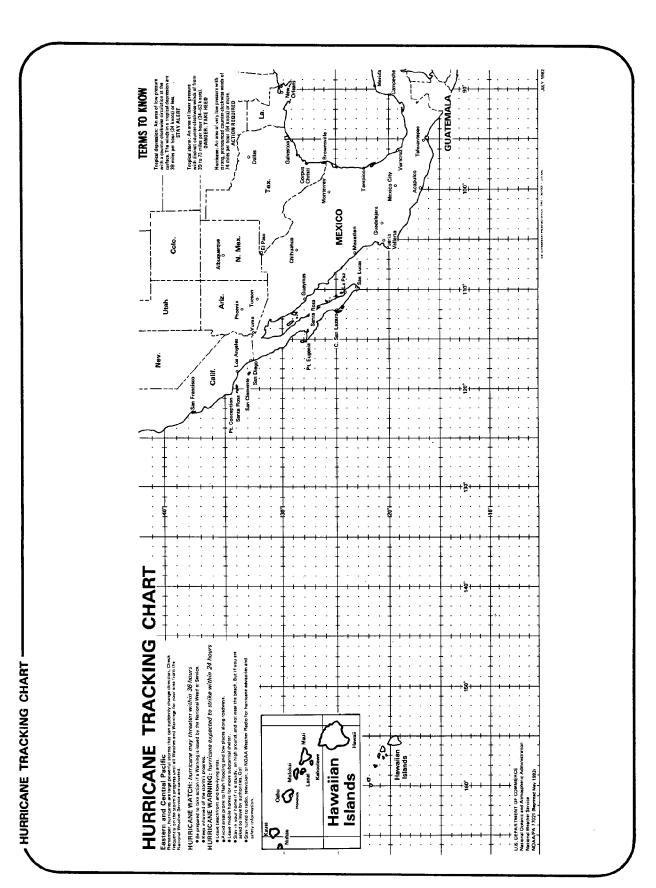
Deline carefully, with for dangling electrical virus uncleaning of Deline spots for a fortificial rocker or danged water, sever, and electrical lines desired to the carefully bone or the carefully of the carefu

Check often for official bulletins on radio, TV, or NOAA Weather Radio

But many exposed coastal communities are not prepared for a hurricane, and others have











The Naming of

U.S. DEPARTMENT OF COMMERCE National Oceanic and Atmospheric Administration

resent Procedure in the North Atlantic, Caribbean, and Gulf of Mexico

The National Hurricane Center near Miami, Fla., keeps a constant watch on oceanic stormbreeding areas for tropical disturbances which may herald the formation of a hurricane. If a disturbance intensifies into a tropical storm—with rotary circulation and wind speeds above 39 miles per hour—the Center will give the storm a name from one of the six lists below. A separate set is used each year beginning with the first name in the set. After the sets have all been used, they will be used again. The 1982 set, for example, will be used again to name storms in 1988. The letters Q, U, X, Y, and Z are not included because of the scarcity of names beginning with those letters. The name lists have an international flavor because hurricanes affect other nations and are tracked by the public and weather services of countries other than the United States. Names for these lists are selected from library sources and agreed upon during international meetings of the World Meteorological Organization by nations involved.

hy Hurricanes Are Named

Experience shows that the use of short, distinctive given names in written as well as in spoken communications is quicker, and less subject to error than the older more cumbersome latitudelongitude identification methods. These advantages are especially important in exchanging detailed storm information between hundreds of widely scattered stations, airports, coastal bases, and ships at sea.

The use of easily remembered names greatly reduces confusion when two or more tropical storms occur at the same time. For example, one hurricane can be moving slowly westward in the Gulf of Mexico, while at exactly the same time another hurricane can be moving rapidly northward along the Atlantic coast. In the past, confusion and false rumors have arisen when storm advisories broadcast from one radio station were mistaken for warnings concerning an entirely different storm located hundreds of miles away.

he Six-Year List of Names for Atlantic Storms

1983	1984	1985	1986	1987
Alicia	Arthur	And	Allen	Arlene
Barry	Bertha	Bob	3onnie	Bret
Chantal	Cesar	Claudette	Charley	Cindy
Dean	Diana	Danny	Danielle	Dennis
	Edouard	Bena	Earl	Emily
Felix	Fran	Fabian	Frances	Floyd
Gabrielle	Gustav	Gloria	Géorges	Gert
Hugo		Henri	Hermine	Harvey
Ir is		tsabel	Ivan	rene
		Juan	Jeanne	Jose
	Klaus	Kate		Katrina
		Larry		Lenny
		Mindy		Maria
				Nate
				Ophelia
	Paloma	Pet <i>e</i> r		Philippe
	Rene	Rose		Rita
		Sam		Stan
				Tammy
				Vince
Wendy	Wilfred	Wanda	Walter	Wilma
	Alicia Barry Chantal Dean Erin Felix Gabrielle Hugo	Alicia Arthur Barry Bertha Chantal Cesar Dean Diana Erin Edouard Felix Fran Gabrielle Gustav Hugo Hortense Iris Isidore Jerry Josephine Karen Klaus Luis Itil Marilyn Marco Noel Nana Opal Omar Pablo Paloma Roxanne Rene Sebastien Saly Tanya Norky Van Vicky	Alicia Arthur And Barry Bertha Bob Chantal Cesar Claudette Dean Diana Danny Erin Edouard Bena Fablan Fron Fablan Gabrielle Gustav Gloria Hugo Hortense Henri Iris Isidore Isabel Jerry Josephine Juan Karen Klaus Kate Luis Lili Larry Marriyn Marco Mindy Marco Mindy Noel Nana Nicholas Opal Omar Odette Pablo Paloma Peter Roxanne Rene Rose Sebastien Saly Sam Tonya Victy Victor	Alicia Arthur Ana Alen Barry Bertha Bob Bonnie Chantal Cesar Claudette Charley Dean Diana Danny Danielle Erin Edouard Bena Earl Felix Fran Fabian Frances Gabrielle Gustav Gloria Georges Hugo Hortense Henri Hermine Iris Isidore Isabel Nan Jeanne Karen Klaus Kate Karl Luis Iili Larry Lisa Marilyn Marco Mindy Mitch Noel Nana Nicholas Nicole Opal Omar Odette Otto Pablo Patora Roxanne Rene Rose Richard Sepastien Saly Sam Shary Tanya Vicky Victor Virginie

The Names of Particular Individuals Have Not Been Chosen for Inclusion in the List of Hurricane Names.



Hurricanes

istory of Hurricane Names

For several hundred years many hurricanes in the West Indies were named after the particular saint's day on which the hurricane occurred, Ivan R. Tannehill describes in his book "Hurricanes" the major tropical storms of recorded history, and mentions many hurricanes named after saints. For example, there was "Hurricane Santa Ana" which struck Puerto Rico with exceptional violence on July 26, 1825, and "San Felipe" (the first) and "San Felipe" (the second) which hit Puerto Rico on September 13 in both 1876 and 1928.

Tannehill also tells of Clement Wragge, an Australian meteorologist who began giving women's names to tropical storms before the end of the 19th Century.

An early example of the use of a woman's name for a storm was in the novel "Storm" by George R. Stewart, published by Random House in 1941, and since filmed by Walt Disney. During World War II this practice became widespread in weather map discussions among forecasters, especially Air Force and Navy meteorologists who plotted the movements of storms over the wide expanses of the Pacific Ocean.

In 1953, the United States abandoned as confusing a two-year old plan to name storms by a phonetic alphabet (Able, Baker, Charlie) when a new, international phonetic alphabet was introduced. That year, this Nation's weather services began using female names for storms.

The practice of naming hurricanes solely after women came to an end in 1978 when men's and women's names were included in Eastern North Pacific storm lists. In 1979, male and female names were included in lists for the Atlantic, Caribbean, and Gulf of Mexico.

astern North Pacific Names

Given names are also used to identify typhoons and hurricanes in the Pacific Ocean. A set of six alphabetical lists is used in the eastern North Pacific Ocean. As in the Atlantic, the sets are used again when the six year lists are completed. The 1982 list will be used again in 1988.

he Six-Year List of Names for Eastern Pacific Storms

1982	1983	1984	1985	1986	1987
Aletta	Adolph	Alma	Andres	Agatha	Adrian
Bud	Barbara	Boris	Blanca	Blás	Beatriz
Carlotta	Cosme	Cristina	Carlos	Celia	Calvin
Daniel	Datilia	Douglas	Dolores	Darby	Dora
Emilia	Erick	Elida	Enrique	Estelle	Eugene
Fabio	Flossie	Fausto	Fefa	Frank	Fernanda
Gilma	Gil	Genevieve	Guillermo	Georgette	Greg
Hector	Henriette	Hernan	Hilda	Howard	Hilary
lva .	kmael	Iselle	Ignaci o	Isis	lrwin .
John	Juliette	Julio	Jimena	Javier	Jova
Kristy	Kiko	Kenna	Kevin	Kay	Knut
Lane	Lorena	Lowell	L inda	Lester	Lidia
Miriam	Manuel	Marie	Marty	Madeline	Max
Norman	Narda	Norbert	Nora	Newton	Norma
Olivia	Octave	Odile	Olaf	Orlene	Otis
Potul	Priscilla	Polo	Pauline	Paine	Pilar
Rosa	Raymond	Rachel	Rick	Roslyn	Ramon
Sergio	Sonia	Simon	Sandra	Seymour	Selma
Tara	Tico	Tructy	Terry	Tina	Todd
Vicente	Velma	Vance	Vivian	Virgit	Veronica
Willa	Winnie	Watlis -	Waldo	Winifred	Wiley



S: U.S. GOVERNMENT PRINTING OFFICE: 1982 - 360-009 - 227/2055

NOAA/PA 79017 (Revised May 1982)

for coastal and inland flooding Federal Emergency Management Agency Federal Insurance Administration safety tips

AFTER THE FLOOD

■ Call the insurance agent or broker who sold you your flood insurance beitly immediately, if your home, apartiment or business has been damaged by the flood. The agent will submit a loss florm and and subsigned to inspect the property. That actuates will call on you as soon as possible to inspect the damage your property has realized. Those with the most serious damages will be handled tits:

- Have handy your insurance policy and your list of possessions to simplify the adjuster's work. This will help settle your claim sooner:

 When it is safe to return to your home, before you enter the house, be sure that the structure is not in danger of collapsing.

 Open windows and doors to let the air circulate. This will help remove foul doors and protect you from escaping gas. It will also help dry out the house. Take pictures of the damage—both to the house and its contents.

 Don't strike a mach on use a flame when you enter the house sepang gas could cause a tragic explosion. Walch for live electrical wires. Be sure the electrical current is turned oil, and of ord attempt to futto on any electrically operated light or appliance until an electrical power that the power is the propriet of the propriet
 - Begin cleanup as soon as possible. Throw out any pestistable Nocks: they may be contaminated. Hose down hardgoods such as major appliances and furniture, even if they are destroyed. You need to keep these for the adjuster's inspection. The adjuster will help you make decisions on repaining possessions or getting tid of them.

Pump out the basement if it is flooded, but do
 It gradually. Dain one-third or the flood
 waters each day, to minimize further struc ture demage. Shovel out the mud white it is
 still moist, and dry rugs and carpets
 thoroughly.
 Make any lemporary repairs necessary to
 stop further losses from the elements or from
 looting. Keep your receipts for these repairs.
 They may be covered by your flood insurance
 policy.



Floods cause more damage nationwide than any other natural dissiser. If you live in a flood-prore area, be smart. Profect yourself and your lamity from the consequences of a flood disaster. It could happen to you. Cast your local insurance agent or broker now to ask about flood insurance. For general information, write.

Federal Emergency Management Agency Federal Insurance Administration Washington, D.C. 20472

August 1984 (Supersedes 1-107 dated May 1982 which may not be used.) L-107



rricane-floods

Hurricanes are the greatest storms on earth. You should be concerned about them, whether you live on the coast or inland.

For Coastal Residents:

If you live near the Gulf of Mexico or along the Eastern Seaboard, you probably know the furricane season starts in June and can continue through twoember. As the hurricane season approaches, you should prepare for it. Locale the proteches, you should prepare for it. Locale the low-lying sections of your community so you can avoid them. Find the safest route to high ground. After you have made all the necessary prepareilings to protect; your ramily and your property, are you fully ready to deal with a hurricane?

Are you sure? Do you have flood insurance? Many people do not know their homeowner's insurance policy does not cover losses from llooding

Most coastal damage caused by hurricanes is the result of looding from giant weaves driven by the hurricane winds. A hurricane could up our property improvements. If the insurance adjuster determines flooding caused the devastation, not the hurricane winds, you could be out of tuck unless you have flood insurance.

For Inland Residents:

People who live well inland from the coast often leet links will not be affected by an approaching hurricane, which so the well of a solid furticane winds and wasse. Tues, as a hurricane moves inland, its wind forces weaken rapidity, But Inland flooding caused by burricanes can be extensive. The tons of water the storm picked up over the ocean will be released as the storm worse inland. Bandall tron a burricane some times can be preserved and the coast of the coast of

Inland residents also need to prepare for hur-ricans by purchasing fleed insurance. Hemenber, the damage to your home and its contents is not covered by your homewher's in-surance policy. Even it the flooding in your home measures only one or two inches; it can mean rulined carpets, some furniture destruction parhage even the loss of a major appliance. And if the water did structural damage, the costs of repair and restoration could mean the end of



vacation plans, a child's education plan, even a major setback to your long-range budget plans. Without flood insurance, a major flood loss could add up to financial ruin.

BEFORE THE FLOOD

■ Purchase flood insurance. If the community you'le in has joined the National Flood insurance Program with a pledge to adopt flood plain management measures, you will be eligible to apply for it. Only a floreday wall is required for your flood insurance policy to become effective. Penters can buy policies to profect their personal property against possible flood damage, too.

A Federal program, the National Flood in-surance Program, administered by the Federal Emergency, Management Agency, makes this possible. A simple call to your in-surance agent or broker starts the process to cover your home, possessions, and business Your agent or broker will help you decide how much coverage you need.

List all your personal property. Make an itemized its of your protection and valuables. This list is for your protection and will help prove your claims are valid. It's a good foreat to lake prove your claims are valid. It's a well as of your home—both inside and out These photos will help adjusters to settle your claims. They can also help prove uninsured losses, which are tax deductible.

■ Keep your policy and your list of personal property in a safe place, such as a safe deposit box. Be sure to remember, or to carry in your waller, the name and address of the agent or broker who wrote your policy.

■ Learn the safest route from your home or place of business to high, safe ground, should a flood occur. Practice taking these routes. If there is a flood, you may only have minutes to get to safety.

IF THE FLOOD COMES

- Keep your battery-operated radio tuned to a local station, and follow all instructions. Keep carm, but if you are told to evacuate, move out of the house or building to safe, high ground.

 Turn of all utilities at the main switch if evacuation is necessary—BUT ONLY IF TIME PERMITS. Do not locuch any electrical equipment utiless it is in a diff area of you are standing on a piece of dry wood with rubber footwear and groves on.
 - Open basement windows to equalize water pressure on the foundations and walls...BUT ONLY IF TIME PERMITS.

- Move all the valuables you can to a higher floor if there is one—BUT, AGAIN, ONLY IF TIME PERMITS.
- Be aware that floods are deceptive. Avoid already flooded areas. Do not attempt to cross any stretch of flood waters on foot if the water is above your knees.

 Know that in floods cars can become coffins. DO NOT DRIVE WHERE WATER IS OVER ROADS. Under those flood waters, the road could atteady be wasted away and rapidly its ling water could lift the car and carry it away—with you in it. Getting your feet wet on



the way to higher ground is preferable to never getting there.

Be extra careful if you have to evacuate in your car an inglift in the dark, you can't see the flood dangers. If, by mistake, you find yoursell driving in water and the car stale, get out of the car and climb to high ground immediately.

rising flood waters, move to the second floor andor, if necessary, to the noof. Take warm clothing and a flasshight with you, as well as your battery-operated radio. Don't try to swim to safety, Watt for help. Rescue learns will be looking for you. If you're caught in the house by the suddenly



from the next disaster? Are you protected

If You're Flooded Out, You Don't Have To Be Wiped Out.



593-236/0583

FEDERAL EMERCENCY MANAGEMENT AGENCY FEDERAL INSURANCE ADMINISTRATION NATIONAL FLOOD INSURANCE PROGRAM



Amounts of Insurance Available

But you must act in advance—remember, there is a five-day waiting period on rew policies. Once a storm warning best insued, rational flood insurance may be the only, thing standing between you and financial dissorer. Call a local agent or broker tockly.

The following limits of insurance are available through the National Hood Insurance Pregram Check with a local agent or broker to determine whether your community is in the Emergency or Regular Program phase.

\$185,000 250,000 250,000 200,000 60,000 300,000 200,000 \$ 35,000° 100,000° 100,000 100,000 BUILDING Single Family All Other Residential Small Business† Any Other Structure CONTENTS
Residential
Small Business†
Any Other Structure

For Alexa, Havaii, Guam and Virgin Islands, the building limits are:
•\$60,000 and •*\$150,000
+*Check with your agent to see if you qualify.





"The onrush of water was terrific. You could bear those big boulders rolling down the creek and people calling out. In between flashes of lightning you could see the bouses moving... All of a sudden one would fall apart and there weren't any more screams."

resident near Johnstown, Pa., July 20, 1977

At 9 p.m. on July 19, 1977, the first thurdershowers gave a welcome relief to the 90 degree heat in Johnstown, Perusylvania.

Just after midnight, two Jocal rivers began overflowing their light-farmwiseld, walk and the flood that experts said could never largent became a retain. The first foil ... now than "340 families affected. 70 persons dead, 400 humes completely destroyed and 445 small bust nesses either destroyed or severely damaged.

The potential for this kind of disaster is just as great today. The keveling of forests and rechaliding of lands have meant that soil can no longer absorb excess water the way it once did, so with little warning a storm can turn into a decastating flowd—even if you don't live near once of storm can arrive or extram.

Flooding as a National Problem

future floxating

Until the late 1950s, most property owners were unable to get insurance against food damage. Private insurance firms, avare of the potential for existorybite losses, were unwilling to assume the financial risk alone. This part the brutch on tagapares to provide costly dissesterelief to a governing number of flood victims.

This put the burden on taxpayers to provide costly disaster relifies a provide that the factorians. In 1808 Cangress addressed this issue by creating. National Board Insurance Program (NPP). This federal program provided flood insurance at a reasonable cost in excluding for ribe cartell intaragement of flood poxed areas beloes a consumate to be local communities.

area by local communities.

Tokin; the NHP serves nearly two million policy-holders in 17000 communities across the country, it is currently being administered by the federal Energency Management Agency (FEMA) through its Federal Energency ance Administration.

Your Homeouners Policy Isn't Enough

Lisses due to floxding are intracered under mest homeworders policies, viu can, however, protect your home and its contents through the NFIP if your community is participating, in the program.

nity is participating in the program. To become eligible, a community first enters the emergency place of the URFP by adopting pertiringny actions to reduce the flood threat. Everyone in that community can then apply for limited amounts of flood insurance at electrally-subsidized rates.

Much higher levels of insurance become available when a community qualifies for the regular program place. This occurs after FRM has conducted a detailed flood study, and focal officials have enacted more stringent measures to safeguard life and property from

To find out more about flood insurance and whether wore community is eligible, ask any licensed property-casualy agent or broker—the same person who sells your home and auto-policies.

Other Facts You Should Know

☐ Hevol insurance is available on almost any enclosed building and its contents. This includes homes, condominar, mobile homes on foundations, businesses and farms. The contents of a rental unit are also insurable.

□During the program's *emergency* phase, single-family homes can be insured up to \$35,000 on the build-

ing and up to \$10,000 on contents. These amounts increase to \$185,000 on building and \$60,000 contents under the NIPs regular phase. □There is a free-day waiting period from the time a palicy is purchased until you are concared, with the following exceptions.

□When converage is increased on a policy, or when a

□When coverage is increased on a policy, or when a community has participated 30 days or less in either of the program planes, there is a waiting period of just one day.

 \square At the time of title transfer, coverage becomes of fective immediately.

☐ Hood insurance is required by law in order to get feederally secured financing to buy, build or improve structures in the flood bazed areas of a participating community. This includes feederal grants, FHA and VA leans, as well as mest conventional mortgage leans.

□ Preventative measures to reduce flowd damage to an insured building are other reimbursable. Policyholder may also recover the cust of retuvoing insured content from a building that hes been declared in intuinion danger of flowding by community officials. This includes the removable and/or temporary storage of contents up to a maximum of § 5 days.

The Next Step is Up to You

A a time when flexding causes more than \$2 hillism in property dange each yea; you cannot afford to think that it will never happen, to you. It can happen, and often when its feast expected.





Refrigerations, softs, and other hard goods should be beved of and kept for the adjuster's inspection. A good develorizer when eleming major kitchen appliances is to add one teaspoon of basing sods to a quart of water. Any partially changed items should be dired and aired, the adjuster will make recommendations as to their repair or days all lake pictures of the damage done to your building and contents.

"Iske all wooden furniture cutdoors, but keep it out of direct satisfies to prevent warping, general experience or carport is a good place for driving. Remove drawers and other moving parts as swon as possible, but do not pro open swelford-awers from the from the second or provided and past the drawers out.

☐ <u>Sharel out muclabile it is still maist</u> to give walls and thorns a character to the Chore platerer with larve dried. In orash off toose dirt. Wash with a mid sape selution and rinse with clean water; always start at the *bostoom* and work up. Callings are chore last. Special autention at this carry stage should also be paid to dearing out heating and plumbing systems.

☐ Midew can be removed from dry waxd with a solution of 4 to 6 tablespoons trisodium phosphate (TSP), I cup liquid chlorine bleach, and I gallon water.

☐ <u>Ocean nectal at once</u> then wipe with a kerosener, sedeed cirth A light cast of seit will prevent into from nesting Sear all utensits and, if recessing, use fine seed word on urpositised sarfaces, duminion near be bright eneed by senabhing with a solution of vinegar cream of tartar, and hot water.



to dry (stourth, attury from direct beau) before brushing off losse dire. If you cannot get to a professional eleaner, off new the items in lukewarm water to remove lodged soil. Then wash with mild decrepent, rise and dry in ☐ Quickly separate all launder items to avoid running colors. Clothing or hyselydd fabries shauld be allowed sunlight.

☐ Flooded basements should be drained and cleaned as soon as possible. However, structural darage can occur by pumping out the water to a quick, Affer the flood, waters around your property have subsided, begin draining the basement in sages, about 1/3 of the water volume each day.

What Does National Flood Insurance Mean to You?

Until the late 1966s, flood insurance was practically unavailable to home and/purses-sowher.

Since private insurance firms were unwilling to assume the fluxuach first and experience of the coreate the National Rood insurance Program (NIPP). This federal program provided flood insurance at reasorable cost in exchange for the careful naragement of flood prone areas by local communities.

Today, you can insure almost any enclosed building and its contents against flood loss as long as your community is participating in the NIPP.

Remember, most standard homeowners policies do nox cover flood loss. For more details on flood insurance protection, call your agent or broker today.

GPO : 1983 0 - 408-158

IN THE EVENT OF A FLOOD



loss of life & property Tips to minimize

You Don't Have To Be Wifed Out. If You're Flooded Out,



FEDERAL EMERCENCY MANACEMENT AGENCY FEDERAL INSURANCE ADMINISTRATION NATIONAL FLOOD INSURANCE PROCRAM

593-137/1683





"About 11 o'clock last night the water started coming in over the Whatever is gone in this neigbborbood is gone. It's a total loss." bridge. Between 11 and 11:20 it was incredible bow fast it rose. There was really no time to move. Or get out. Or anything...

resident of Austin, Texas, May 24, 1981

Even if you've never experienced a major floxd, you ought to know what to do if floxdwaters threaten your

community:
The following tips from the National Houd Insurance
Preform Municipal or a suggested guidelines for
action Of course, fiyth find yourself in a flood simulon
and do not know what to do, check with local dissuser officials.

Steps to Take Today

The sufety of your family is the most important con-sideration. Since flooducters can rise very rapidity, you should be preferred to evacuate before the trater level reaches your property.

When the Flood Comes

☐ Keep a battery:powered radio tuned to a local station, and follow all emergency instructions. ☐ If you're caught in the house by suchdenly rising

Make an itemized list of personal property, including farmishings, clobbing, and valuables. Photographs of your home-inside and out—are bedful. This will exist an adjuster in settling claims and will belp prove uninsaired losses, which are text deductible.

☐ Learn the safest reate from your home or place of business to high, safe ground if you should have to evacuate in a hurry.

waters, mowe to the second from and, if necessary, to the roof. Take ware clothing at labeling, and portable radio with you. Then wait for belo, don't try to svim to safety Rescue teams will be looking for you.

☐ When cutside the house, remember...FLOODS ARE DECEPTIVE. Ty to avoid flooded areas, and don't at

tempt to walk through floodwaters that are more than snee deep.

- ☐ <u>Keep a portable radio</u>, emengency cooking equipment, and flashlights in working order.
- ☐ Rexams who live in frequently. Boxaled areas should keep on hand materials such as sandbage, phywocd plastic sheeting, and lumber which can be used to pro-tect pnyery. (Remember, sundbags should not be strucked directly against the nuter usults of a building. since, when wet, the bags may create added pressure on the foundation.)
- ☐ Ber, flood insarance, You should contact your prop-ent/Casality agent or horker about eighbility off flood insarance, which is offered through the National Brood Insarance Program, Centreally, there is a five-day wait-ing period for this policy to become effective, so dun't wan until the best finante to apply.

regular supplies are contaminated. You can sanitize these items by first rinsing with bleach. Fill hathtubs, sinks, and jugs with clean water in case

| Kecp.your insurance policies and a list of personal property in a sife place, such as a safety-deposit box. Know the rature and location of the agent(s) who issued these policies.

- ☐ Board up_windows or proxect them with storm shutters or tape to prevent flying glass.
- Hing outdoor possessions inside the house or the them down securely. This includes lawn furbiner, garbage cars, tools, signs, and other moveable objects that might be swept away or hurled about.
- D If it is safe to evacuate by ear, you should consider the following:
- Stock the sar with norperistable foxes (tibe canned goods), a plastic container of water, blankers, first aid kit, flashlights, dry clothing and any special media cation needed by your family:
- ☐ Keep the gas rank at least half full, since gasotine pumps will not be working if the electricity has been cut off.
- ☐ Do not drive where water is over the roads. Parts of the road may already be washed out.
- ☐ If your car stalls in a flowled area, abardon it as soon as possible. Brokwaters can rive rapidly and sweep a car (and its occaponits) away. Man, deaths have resulted from attempts to move stalled vehicles.

After the Flood

If your home, apartment or business bas suffered food diamege, timedearly call be agent or broken who brankes your flood insurance policy, the agent will then submit a loss form to the hattoned Flood businence Program, An adjuster will be assigned to

wood while wearing rubber gloves and rubber-soled \square Move valuable papers, furs, lewelry, clothing, and other contents to upper floors or higher elevations.

boots or shoes.

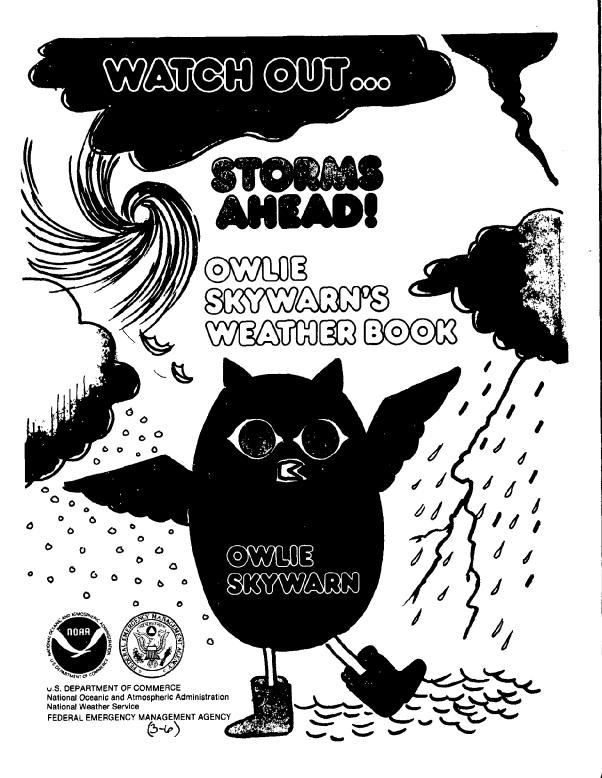
☐ Tum off all utilities at the main power switch and close the main gas valve if evacuation appears necessary. Do not touch any electrical equipment unless it is in a day area and you are standing on a piece of day

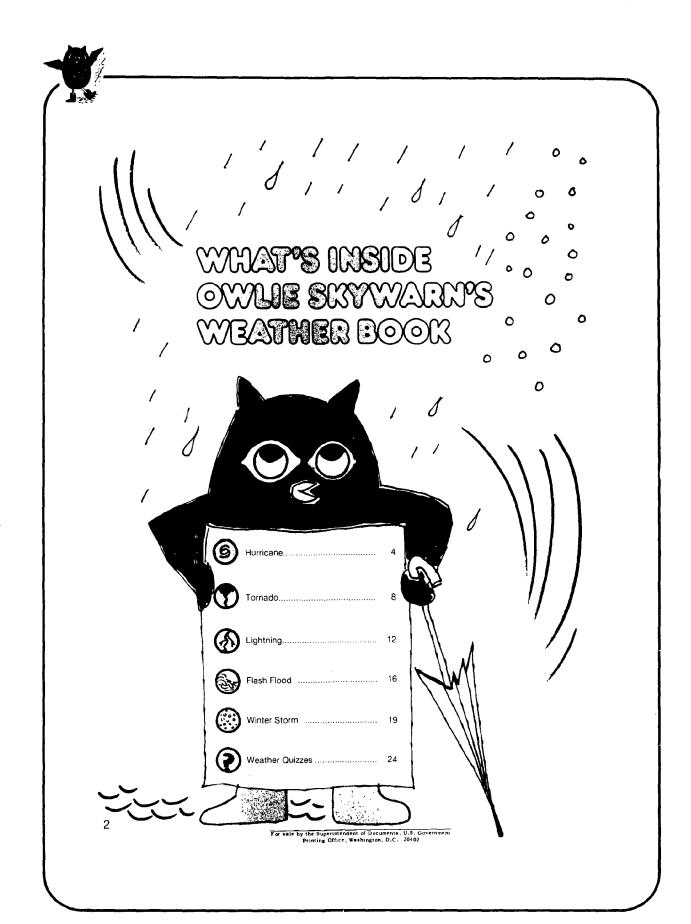
 \Box <u>if, and only if, time permits</u>...there are several precautionary steps that can be taken.

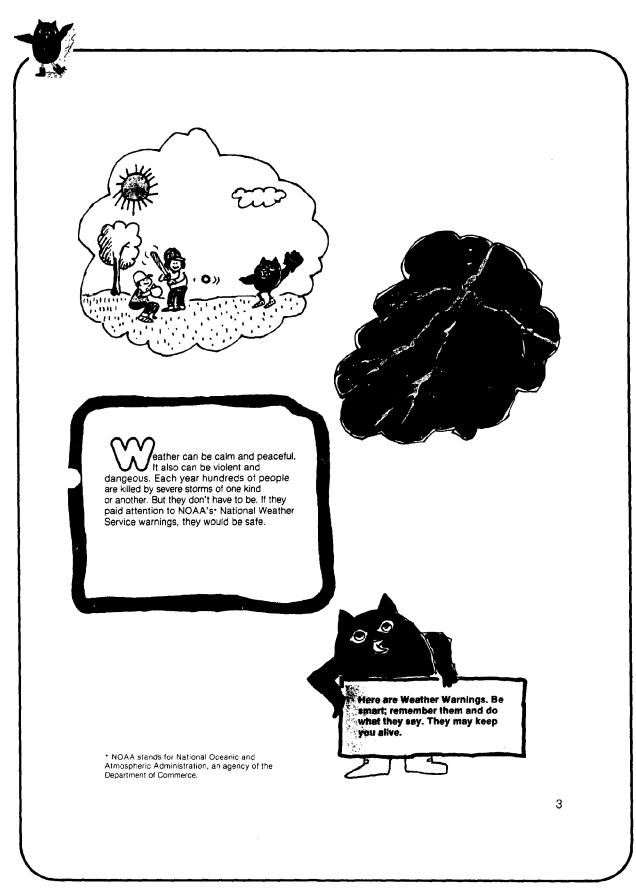
inspect your property as soon as possible.

- age. Make sure it is not in danger of collapsing. Turn off any outside gas lines at the meter or tank, and let the house air for several minutes to remove foul odors or Drior to entering a fuilding, check for structure damescaping gas.
- [] Ipon entering the building, do not use open flame as a source of light since gas may still be trapped inside; a battery-operated flashlight is ideal.
- ☐ Watch for electrical sharts on live wires before making certain that the main power sworte is turned off. Do not turn on any lights or appliances until an electrician has checked the system for short circuits. Cover broken windows and holes in the roof or
 - walls to prevent further weather damage. The expense of these temporary repairs is usually convered under your flood insurance policy (subject to the policy deductable). Therefore, it is important to save receipts.
- verti any health hazarik. Perishahle items which pose a health profess should be Istoca and photographed be fore disarding. Thow out fresh food and periously opened medicines that have come in confact with Proceed with immediate cleanup measures to preflooxbyaters.
- of districting is to mix ½ trapton of liquid commer-cial hands by the trapton of liquid commer-cial hands better with 2½ gallons of water, let sand for the minutes before using. The dar acts can be re-noved by pouring the water from one container to another or adding a pinch of salt. In an emergency, water may be obtained by draining a box water tank or melting we cubes. wiled vigorously for ten minutes (until the public nuter system has been declared safe). Another method Water for drinking and fexed preparation should be

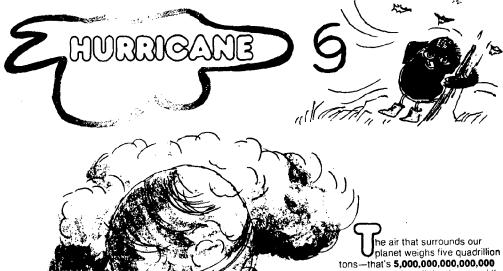










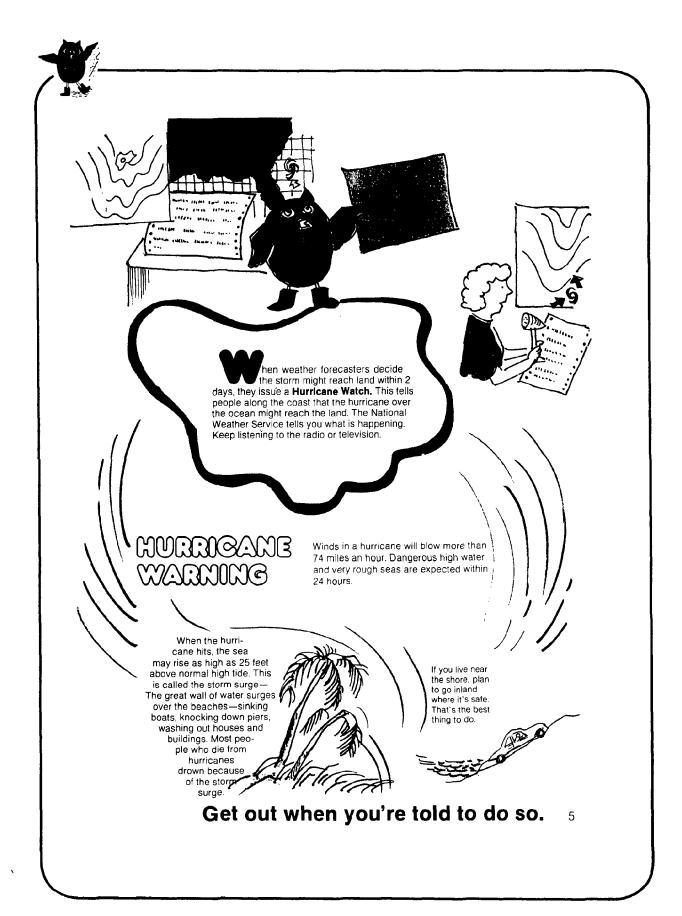


Uplanet weighs five quadrillion tons—that's 5,000,000,000,000,000,000 tons! It is moving all the time—swirling, blowing, sinking, rising. In summer and early fall, great masses lay over the warm oceans. They get hot, pick up lots of moisture, and start swirling. A hurricane is born. Should the hurricane move toward the shore, it could wipe out towns and villages.

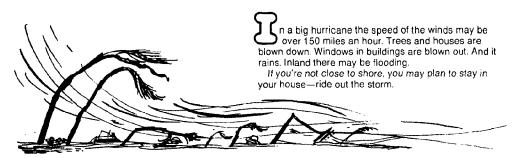
Before the hurricane reaches you—

Long before a hurricane reaches land the National Weather Service knows about it. Satellites have taken pictures of the storm. Hurricane hunter airplanes fly into the storm and report on it. As it comes closer to land, special weather radars track it. Radio, television and more than 300 NOAA Weather Radio stations warn people about the hurricane. It may reach land.









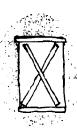
Before the storm comes...



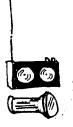
Put tape crisscross on the windows. It prevents flying glass.



 Put boards or storm shutters over big windows.



But stay away from windows during the storm.



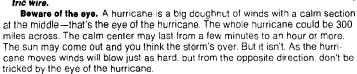
Get a battery radio—the power,will probably go off. Flashlight

Store up some water in bathtubs, jugs and pails—the water mains may be broken. If not, water from faucets may be polluted. Pick up loose things in the yard—toys, tools, flower pots. The wind

could pick them up and make them fly like bullets.

When the hurricane comes...

Stay indoors, Trees could fall on you. You could be blown over. Flying boards, limbs, chairs could crash into you. You could be hit by a live electric wire.



Hurricanes are killer storms. Don't be caught by one. Get out of its way. Go inland. Follow advice.



 prepare for a hurricane.



MARY ANN AND HURRICANE CAMILLE





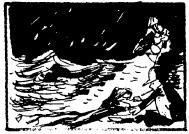
ary Ann lived near the Gulf of Mexico when Hurricane Camille struck her three story apartment building in 1969. Mary Ann was one of 24 people who didn't leave the Richelieu Apartments when they were warned. When the storm surge hit, the



building began to creak and the windows broke out. Water started flooding in and was all over the apartment in a matter of 2 minutes. And the apartment was on the second floor. In about 5 minutes Mary Ann's bed was floating half way to the ceiling. As the building began to fall apart, Mary Ann floated out of the window and



grabbed on to a sofa pillow that came by. She became tangled in wires and debris. It was dark but Mary Ann saw the building come down all around her. The wind was awful. It reached 234 miles per hour during Camille. Mary Ann continued to hold on to anything she could—furniture, tree limbs and parts of houses and buildings. The winds and waves were so strong that everytime Mary Ann grabbed hold of



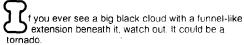
something it would be ripped from her hands. She kept getting hit by the wreckage and was bloody from head to feet from the nails in the boards. This went on for 12 hours before Mary Ann was found 4½ miles away from her home. She was taken to a hospital in very bad shape. She stayed in the hospital for more than 3 weeks



I oday Mary Ann is still living in Mississippi. She tells her story over and over so people will listen when they're told to evacuate.



TORNADO



A tornado looks like a funnel with the fat part at the top. Inside it winds may be swirling around at 300 miles an hour. If it goes through a town, the tornado could flatten houses and buildings, lift up cars and trucks, shatter mobile homes into splinters. Sometimes the path is narrow, but everything in the path is wrecked. But you don't always see the funnel. It may be raining too hard. Or the tornado may come at night, Listen for the tornado's roar. Some people say it sounds like a thousand trains.



Tornado Watch

The Weather Service forecasts that a tornado may develop later. The sky may be blue at the time you hear the watch. Don't be fooled. Listen to the radio for the latest news.



Tornado Warning

A tornado has been sighted. It may move toward you. Dark clouds boil in the sky

sky.
There may be thunder and lightning and heavy rain. And there may be hail. When you see large hail, you may be close to a tornado. Seek shelter.

Power may go off. Funnels reach down from the black clouds.

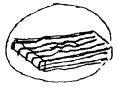




What to do—
IN YOUR HOUSES

- When you hear the tornado watch, keep your eye on the sky for signs of a possible tornado and listen to the radio for the latest advice from the National Weather Service. When you hear the warning, act to protect yourself.
- Get away from windows. They may shatter, and glass may go flying
- Go the the basement. Get under a heavy workbench or the stairs.
- If there is no basement, go to an inside closet, bathroom, or hallway on the lowest level of the house.
- Get under a mattress. Protect your head.





Downtown or in a shopping mall...

- Get off the street.
- Go into a building, stay away from windows and doors.







Outside...

- Get out of a car and inside a house or building.
- Don't try to outrun a tornado in a car. Tornadoes can pick up a car and throw it through the air.

- If you're caught outside, lie in a ditch. Or crouch near a strong building.
- Cover your head with your hands.



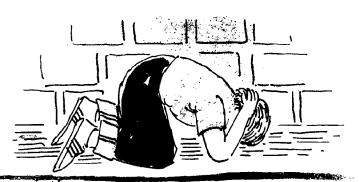


Follow directions

Go to an inside hall on the lowest floor. Crouch near the wall. Bend over with your hands on the back of your head.

Keep away from glass and stay out of big rooms like the gym, cafeteria, or auditorium.

Keep a battery radio on. Listen for news about the tornado.



f you live in a mobile home, get out. Even if it's tied down, a mobile home can be shattered by a tornado. The whole thing can be lifted up and dropped. Get out and into a safer place. Some mobile home areas have storm shelters. If you can't get to a shelter, lie in a ditch and cover your head with your hands.

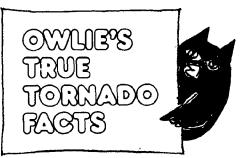
nd remember, when there's a tornado there can be a lot of lightning.

- Stay away from anything that uses electricity.
- Stay away from anything metal faucets, radiators, sinks, and tubs.

Tornadoes are scary.
They pack a lot of
energy; enough to blow
down a whole town. But
you can live through a
tornado. Don't panic

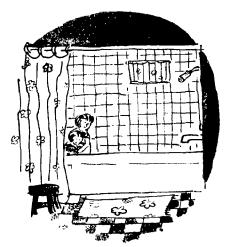
Be smart, know what to do, and do it.



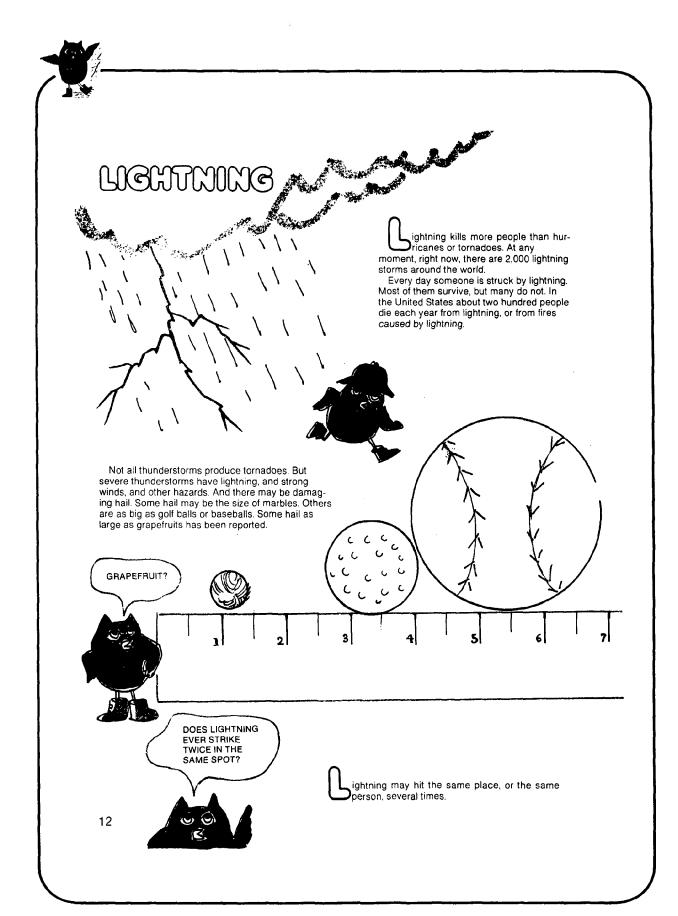


- Most tornadoes are narrow and seldom stay on the ground for more than 15 miles. But the wider ones, up to a mile wide, go further and are the big killers.
- α On April 3-4, 1974, 148 tornadoes moved across 13 states and killed more than 300 people.
- On March 18, 1925 a tornado traveled 219 miles (about 350 kilometers) across Missouri, Illinois, and Indiana and killed 689 people in less than 4 hours.
- In 1931 a tornado in Minnesota litted an 83-ton railroad train with 117 passengers and carried it for 80 feet.
- In 1975 a Mississippi tornado carried a home freezer for more than a mile.





- Tornadoes are rare in many parts of the United States. But they have occurred in all 50 States.
- Oklahoma City has been struck by tornadoes 32 times in the past 90 years.
- One town, Codell, Kans., was struck three times—in 1916, 1917 and 1918—each time on May 20.
- Most tornadoes happen in April, May, and June in the Central and Southeast U.S. but they have occurred in every month and in every State in the Union
- Tornadoes usually travel along the ground at 35 miles an hour, but some can go as fast as 70 miles an hour.
- In Texas a mother huddled in an interior closet with six children. A tornado ripped off the roof of their house, tore down one wall and destroyed their garage. But all seven in the closet weren't even scratched.
- And in Mississippi, a mother and her daughter sought shelter in their bathtub. When the tornado hit the only room left was the bathroom.



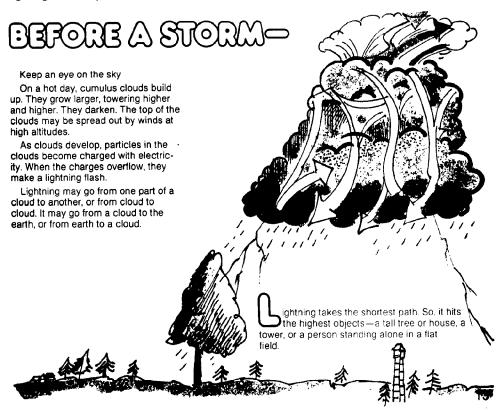


ay Sullivan, a retired National Park Ranger, was hit seven times. He has been knocked down, picked up and thrown into the air; he has lost his shoes and a toenail, and he can't hear as well as he used to. But he's lucky to be alive.

Now he lives in a mobile home with lightning rods on each end, and lightning rods on trees around his home. Hopefully, lightning will follow the rods and leave Ray Sullivan alone.



Lightning storms may occur in winter, but are more common in the summer.





What to do, and not to do, when there is lightning



DO ☐ if you're outside...

Try to get into a house or large building
Get inside a hard-topped car
If you're in a field, crouch on your knees and bend over.
Don't lie down because wet ground can carry electricity
If you're in water, get out. Get away from the beach.



DO⊂ if you're inside...



Stay away from water faucets, sinks, and tubs—anything that could conduct electricity

Keep away from windows and doors



- Don't go into a shed that stands alone
- Don't go under a large tree that stands alone



Don't use the telephone unless there's an emergency



- Don't be higher than your surroundings
- Don't stand on a hilltop
- Don't stay out in a boat

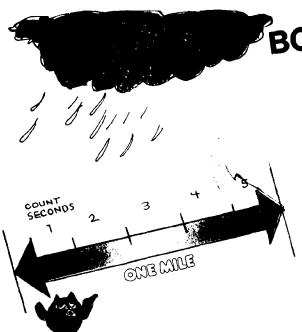


Don't use electric appliances—irons, toasters, mixers—lightning could follow the wire. Stay away from the tv.



 Don't carry anything made of metal, and don't be near anything made of metal.





BOOM!

Thunder and lightning occur together.

The light reaches you at once. Sound takes some time to reach you. Usually you see the lightning stroke before you hear the thunder

As soon as you see lightning, count the seconds until you hear the thunder. If there are 5 seconds, the lightning was about a mile away. (Sound goes about 1000 feet a second.)

In metric, if it takes three seconds to hear the thunder, the storm is about a kilometer away.

If you see lightning and hear thunder at just about the same moment, watch out. The storm is right above you, only a few hundred feet away.

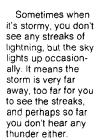
Lightning is also a killer. It strikes people directly. It also, starts fires, and many people die from those fires.

Lightning also does strange things.

It can explode a tree. Lightning heats the sap in the tree trunk. The sap changes to steam. The steam expands and blows the tree apart.

In a herd of cows, one out of a dozen or more might be struck. The others are untouched.



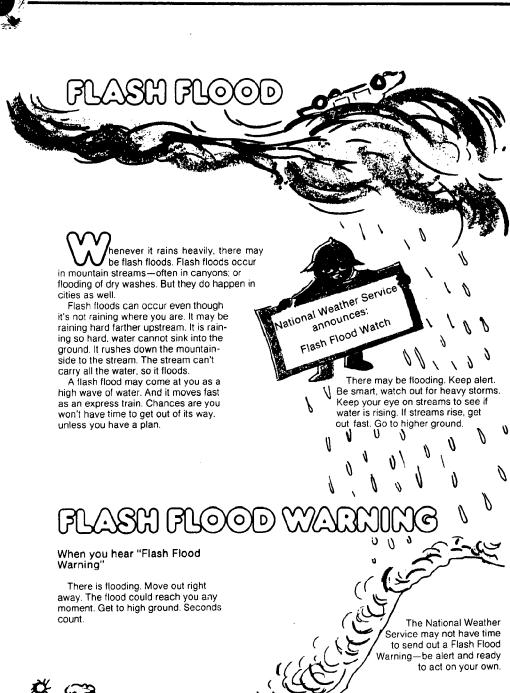
















DON'T PANIO...

Move to higher ground—leave everything and run.

A flash flood can pick up cars, campers, vans, recreational vehicles and roll them downstream. It can tumble huge boulders, uproot trees and carry them, wash out roads and tumble bridges like matchsticks.

CAMPERS...

What to do-

- If the forecast is for heavy rain, stay home.
- If you already have set up camp—stay alert. Keep an eye on the sky. Have a battery radio, and listen to local station.
- Watch for signs of rain—not only where you are, but upstream.
- Plan ahead. Pick high ground for your camp. Also, know which way to move in an emergency to higher ground. Check out the route to be sure it's passable.
- Remember—seconds count. Flash floods move faster than you'd believe possible.





WHEN YOU'TE

Keep out of storm drains in the suburbs and country. Don't play in irrigation ditches, dry washes or other waterways. These places can be dangerous even in fair weather. When it rains the water can get deep fast and the current can be very strong.

There will probably be heavy lightning. When you go to higher ground, stay off hilltops. Don't get under lone trees. Be smart—remember warnings about what to do, and not to do, when there's lightning.





what to do-

- Watch for flooding at bridges and dips in the road
- Never drive where water is over bridges or roads. All of a sudden the bridges or the road could be washed out. They may not even be there under the water.
- If your car is trapped, get out. Move to higher ground. You may lose your car, but you'll save your life.
- If you're driving at night be especially careful.
 Usually you can't see very well because of the
 wind and rain. If you should drive into water,
 don't try to drive out of it. Get out of your car.
 Scramble to higher ground.
- If you're driving through canyon country along a stream and hear a flash flood warning, leave you car and climb to high ground—don't try to outrun the flash flood.





herever flash floods are possible keep a battery radio with you. Keep on a local station or stay tuned to NOAA Weather Radio. The flood may get worse.

Try to keep warm. Keep away from the stream.





WINTER STORM

lash floods and tornadoes can occur somewhere during any month of the year. Not so with snowstorms; they occur in

winter or sometimes in early spring or late fall. Usually the snow piles up slowly, so you have time to get to a safe place. But not always. In a winter storm a few flakes may fall and the next moment there is blinding snow. It's so heavy you can't see to drive or walk. It piles up deeper and deeper. All at once you may be stalled in a huge drift.

You may be trapped.



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The National Weather Service issues—



Winter Storm Watch

There may be heavy snow, blizzards, freezing rain, ice, sleet.

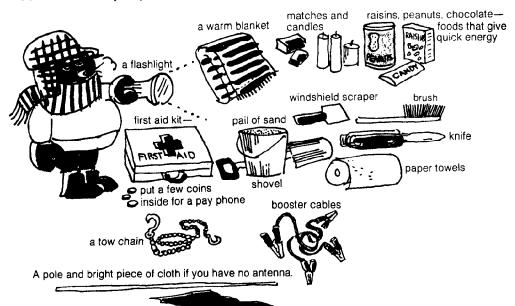


If you're thinking about going outside in a heavy snowstorm, don't! Stay inside.



Before a storm— PREPARE YOUR CAR FOR DEEP SNOW

Be sure to remind your parents to have...





- Tie a bright cloth to the antenna and raise it high so rescuers can find you
- If your car has no antenna, use a pole or fishing rod
- As you sit, exercise. Clap your hands, stamp your feet, swing your arms about. Keep your blood circulating, keep warm don't leave the car
- If engine is running, keep window open a bit. Conserve gasoline and food. You may be stranded a long time
- Leave the overhead light on at night so you can be seen

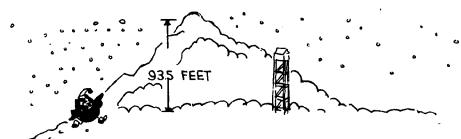


20









The most snow in the United States in one month—390 inches (32½ feet)—fell at Tamarack, Calif. in January, 1911.

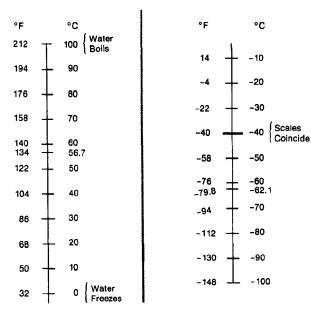
And in one season, the winter of 1971-1972, The state of Season in the State of Washington.



TEMPERATURE CONVERSION

In the United States temperatures are given in Fahrenheit (°F) degrees. The Celsius temperatures, (also called Centigrade) are used in most other countries of the world. Here are both scales so you can convert one to another.

At -40° both scales come together.



23



CHECK YOURSELF ABOUT WEATHER AND WEATHER WARNINGS

FALSE

Try these true or false questions. Ten right—you're a weather wizard; eight right—you're okay; six or less right, take another look at the booklet. It may save your life.

- T F $\,$ 1. Tornadoes kill more people than any other kind of storm.
- T F 2. Hurricanes are very large storm systems.
- T F 3. Wind is the main cause of loss of life in a hurricane.
- T F 4. Lightning never strikes twice in the same place.
- T F 5. Tornadoes occur only in the midwestern states.
- T. F 6. Flash floods occur only when it's raining where you
- T F 7. In a tornado the winds may swirl 200 300 miles an hour.
- T F 8. Winter storms develop only after several hours of warning winds and clouds.
- T F 9. A safe place to be during a lightning storm is inside a hard top car.
- T F 10. During a lightning storm get under a large tree for protection.



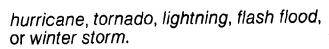
ANSWERS

-1

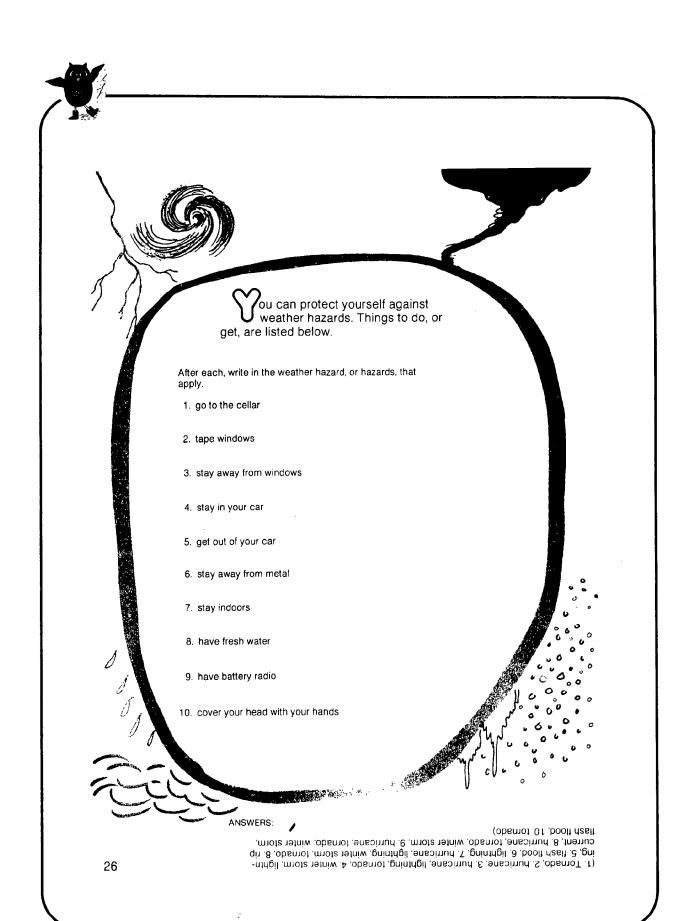


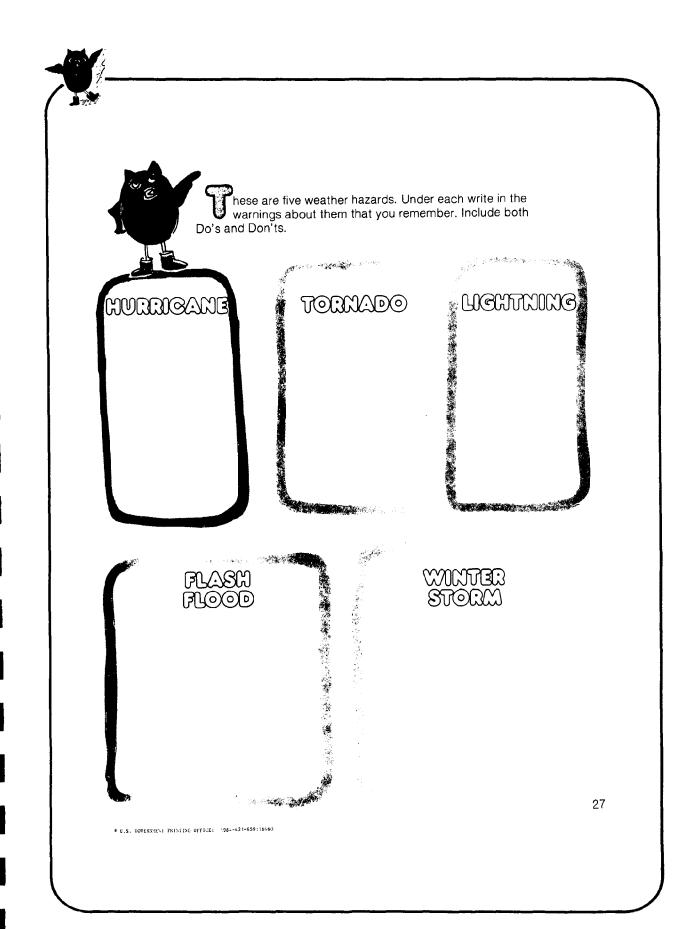
WEATHER

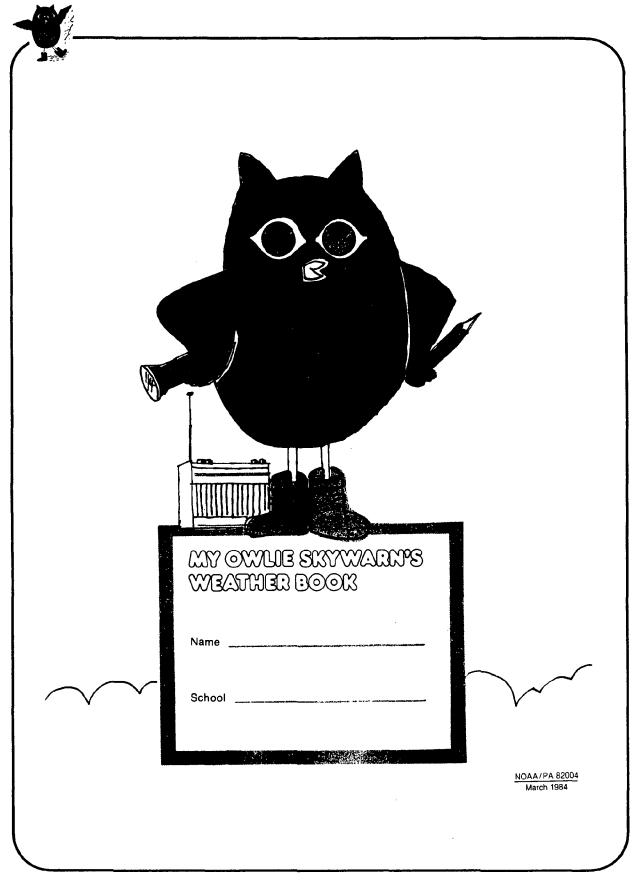
FILL IN EACH SPACE WITH THE MOST CORRECT WEATHER HAZARD



The path of a is sometimes narrow, but very destructive.	
Usually before a hits you see a fun- nel extending from a dark cloud formation.	
Usually high towering clouds develop before astorm.	
Severe can occur as late as April, which happened in 1982.	
 usually occur in valleys where there are narrow stream beds. 	
 A is an extensive storm that usually develops in August or September. 	
7. In a the winds blow at least 74 miles an hour.	
When a approaches, go the cellar or to an inside closet or hall.	
 When a approaches, get away from the seashore; go to a safe inland location. 	
10. Don't try to outrun a in your car.	
(1. fornado, 2. fornado, 3. lightning, 4. winter storm, 3. flash flood, 6. hurricane, 7. hurricane, 8. fornado, 9. hurricane 10 fornado)	
的时间,我们就是一个人的时间,我们就是一个人的时间,我们就是一个人的时间,我们就是一个人的时间,我们也没有一个人的时间,我们就是一个人的时间,他们就是一个人的时	









RECANE SAFETY RULES

Hurricane advisories will help you save your life. . . but you must help. Follow these safety rules during hurricane emergencies:

- Enter each hurricane season prepared. Every June through November, recheck your supply of boards, tools, batteries, non-perishable foods, and the other equipment you will need when a
- hurricane strikes your town.

 2. When you hear the first tropical cyclone advisory, listen for future messages; this will prepare you for a hurricane emergency well in advance of the issuance of watches and warnings.
- When your area is covered by a hurricane watch, continue normal activities, but stay tuned to radio or television for all NOAA National Weather Service advisories. Remember: A hurri-cane watch means possible danger; if the danger materializes, a hurricane warning will be issued. Meanwhile, keep alert. Ignore
- 4. When your area receives a hurricane warning-
- Plan your time before the storm arrives and avoid the last minute hurry that might leave you marooned or unprepared. Keep calm until the emergency has ended.
- Leave low-lying areas that may be swept by high tides or storm
- Moor your boat securely before the storm arrives, or evacuate it to a designated safe area. When your boat is moored, leave it, and don't return once the wind and waves are up.
- Board up windows or protect them with storm shutters or tape. Danger to small windows is mainly from wind-driven debris. Larger windows may be broken by wind pressure. Secure outdoor objects that might be blown away or uprooted.
- Garbage cans, garden tools, toys, signs, porch furniture, and a number of other harmless items become missiles of destruction in hurricane winds. Anchor them or store them inside before the
- Store drinking water in clean bathtubs, jugs, bottles, and cooking utensils; your town's water supply may be contaminated by flooding or damaged by hurricane floods.
- Check your battery-powered equipment. Your radio may be your only link with the world outside the hurricane, and emergency cooking facilities, lights, and flashlights will be essential if utilities are interrupted.

- Keep your car fueled. Because of flooding or interrupted electrical power, service stations may be inoperable for several days after the storm strikes, due to flooding or interrupted electrical power.
- Stay at home, if it is sturdy and on high ground. If it is not, move to a designated shelter and stay there until the storm is over.
 Remain indoors during the hurricane. Travel is extremely danger-
- ous when winds and tides are shipping through your area. Monitor the storm's position through NOAA National Weather Service advisories

AVOID THE EYE OF THE HURRICANE

If the calm storm center passes directly overhead, there will be a lull in the wind lasting from a few minutes to half an hour or more. Stay in a safe place unless emergency repairs are absolutely necessary. But remember, at the other side of the eye, the winds rise very rapidly to hurricane force, coming from the opposite direction.

- 5. When the hurricane has passed
- Seek necessary medical care at Red Cross disaster stations or
- Stay out of disaster areas. Unless you are qualified to help, your presence might hamper first aid and rescue work.

 Drive carefully along debris-filled streets. Roads may be undermined and may collapse under the weight of a car. Slides along
- cuts are also a hazard.
- Avoid loose or dangling wires, and report them immediately to your power company or the nearest law enforcement officer.
- Report broken sewer or water mains to the water department. Prevent fires. Lowered water pressure may make fire fighting
- difficult. Check refrigerated food for spoilage if power has been off during
- the storm. Remember that hurricanes moving inland can cause severe flooding.

Stay away from riverbanks and streams. NOAA National Weather Service advisories will keep you informed on river flood stages.





American Red Cross





STORM/ SURGE/ Killer From the Sea

A hurricane causes the sea level to rise above normal tidal heights, with giant wind-driven waves and strong, unpredictable currents. These are the hurricane's worst killers. If you live in a coastal area, be prepared.

Know the elevation of your property above mean sea level. This information is available from city and county engineers.

Have a safe evacuation route planned. Your community's hurricane preparedness plan should include designated safe areas, areas to be

evacuated during a hurricane emergency, and safe evacuation routes to shelter.

Learn the storm surge history for your area.

During the hurricane emergency, stay tuned to your radio or television for the latest NOAA National Weather Service advisories, and follow hurricane rules.

Hurricane watches mean a hurricane may threaten an area. Hurricane warnings mean a hurricane is expected to strike an area within 24 hours.





American Red Cross



The programs of the American Red Cross are made possible by the voluntary services and financial support of the American people.





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FACT SHEET FOR HURRICANE/TROPICAL STORM PROBABILITIES

The National Weather Service issues hurricane/tropical storm probabilities in public advisories to realistically assess the threat of a hurricane or tropical storm hitting your community. The probabilities are defined as the chance in percent that the center of the storm will pass within approximately 65 miles of 44 selected locations from Brownsville, Texas, to Eastport, Maine.

Probabilities are intended primarily for decisionmakers in local government and private industry who must begin protective actions early. Local emergency management officials use probabilities to help decide when to begin evacuation and open shelters.

Probabilities are issued four times a day, at 6 AM, noon, 6 FM, and 10:30 PM Eastern Daylight Time and are appended to the public advisories in tabular form.

There are several key points to remember. First, if you live between two listed locations, you may estimate your chance of being affected by averaging the numbers on either side. Second, to assess your threat compare the probability of your community with those of neighboring locations. If you have the highest value, your hurricane threat is greatest. Finally, you should be sensitive to increasing values from one advisory to the next. Increasing probabilities indicate a greater risk than those that remain the same or decrease.

When the hurricane is 36-72 hours from predicted landfall, probabilities are quite low. The numbers increase more rapidly as the storm gets closer than 36 hours. If a storm is forecast to be directly over your location in 72 hours, the maximum probability is 20 percent. At 48 hours from predicted landfall, the maximum is 13 to 18 percent. When the storm is less than 24 hours from forecast landfall, the values increase even more rapidly to 60-70 percent.

If you live in an area where it takes a long time to evacuate because of traffic congestion, you may have to leave when values are low. You should listen carefully to your local officials concerning evacuation for your community and heed their advice. If you wait too long, your escape route may be cut off by rising storm tides as the hurricane gets closer.

Use caution when interpreting the probabilities. Potential loss of life and property will vary depending on the intensity of the storm. The figures do not tell you about intensity; that information is given in the advisory. Secondly, hurricane/tropical storm probabilities must not be confused with precipitation probabilities which are routinely included in Weather Service forecasts. Not only are the two computed differently, but the implications of being rained on and being hit by a hurricane are markedly different.





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KEY TERMS

HURRICANE: A pronounced rotary circulation with a constant wind speed of 74 miles per hour (64 knots) or more, that is usually accompanied by rain, thunder, and lightning. Hurricanes often spawn tornadoes.

HURRICANE SEASON: The six-month period from June 1 through November 30 is considered to be the hurricane season.

HURRICANE WATCH: Issued when a hurricane threatens, the watch covers a definite area and time period. A hurricane watch indicates hurricane conditions are a real possibility, usually within 24-36 hours, but it does not mean they will happen. When the watch is issued, everyone in the area should listen for advisories and be prepared to take action if advised to do so.

HURRICANE WARNING: A warning is issued 24 hours before hurricane conditions are expected. If the hurricane path changes quickly, the warning may be issued 10 to 18 hours or less before the the storm makes landfall. Hurricane warnings identify where winds of at least 74 miles per hour are expected. A warning will also say where dangerously high water or exceptionally high waves are forecast even though winds may be less than hurricane force.

HURRICANE LANDFALL: The point and time during which the eye of the hurricane passes over the shoreline. After passage of the calm eye, hurricane winds begin again with the same intensity as before, but from the opposite direction.

GALE WARNINGS: These are issued when winds of 39-54 miles an hour (45-47 knots) are expected.

STORM WARNINGS: These are issued when winds of 55-73 miles an hour (48-63 knots) are expected. If a hurricane is expected to strike a coastal area, gale or storm warnings will not usually precede hurricane warnings.

SMALL CRAFT CAUTIONARY STATEMENTS: When a tropical distrubance threatens a coastal area, small craft operators are advised to remain in port or not to venture into the open sea.

FLASH FLOOD WATCH: Flash flooding, quickly rising water often swift and always dangerous, is possible in the area; stay alert and take precautions.

FLASH FLOOD WARNING: Flash flooding is imminent; take immediate action if you are in a threatened area.

ADVISORY: A National Weather Service message giving storm location, intensity, moement, and precautions to be taken.

BULLETIN: Similar to an advisory.

EYE: The roughly circular area of comparatively light winds and fair weather at the center of a hurricane. Eyes are usually 25-30 miles in diameter. The area around the eye is called the wall cloud. Do not go outdoors while the eye is passing; the full intensity of the storm will reoccur in minutes.

FLOOD: A general and temporary condition of partial or complete inundation of normally dry land areas from (1) the overflow of inland or tidal waters, (2) the unusual and rapid accumulation or runoff of surface waters from any source (often called "flash flooding"), and (3) mudslides which are proximately caused or precipitated by accumulation of water on or under the ground.

HURRICANE CATEGORIES: The National Weather Service categorizes hurricanes by intensity on a scale of 1 to 5, which include:

	<u>Wind</u>	Surge
Category I	74-95 mph	4-5 feet
Category II	96 - 110 mph	6 - 8 feet
Category III	111 - 155 mph	9 - 12 feet
Category IV	131-155 mph	13 - 18 feet
Category V	156+ mph	18+ feet

Two common classifications for hurricanes are:

Major hurricane -- a hurricane with maximum winds of 111 to 135 mph (88-107 knots), and

Extreme hurricane -- a hurricane with maximum winds in excess of 136 mph (118+ knots)

STOFM SURGE: An abnormal rise in the level of the sea produced by a hurricane. This inundation is usually responsible for the greatest loss of life and destruction of property. Danger extends for hundreds of miles from the center of the hurricane. Storm surge, also known as tidal flooding, is responsible for nine out of ten hurricane deaths.





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SEICHE (pronounced saych): A phenomenon whereby a series of fast-moving, steep waves are superimposed on the storm surge. The huge wall of water may cause total destruction and great loss of life.

SUBSIDENCE: Sinking of the land, caused mainly by the withdrawal of underground water from wells supplying cities and industries. This phenomenon may cause coastal areas to become more vulnerable to tropical storm flooding.

TORNADO: A violently rotating air column, nearly always observable as a funnel cloud. These storms—which can occur anywhere at any time—are often spawned by hurricanes.

TORNADO WATCH: Issued when tornado conditions threaten, the watch covers a definite area and time period. A tornado watch indictes tornado conditions are a real possibility; everyone in the area should listen for advisories and be prepared to act quickly if a tornado warning is issued.

TORNADO WARNING: A warning is issued when tornado conditions are imminent or when a funnel cloud is sighted. The warning will describe the "downstream" area that might be affected, and persons in the threatened area should take cover immediately.

TROPICAL DISTURBANCE: A moving area of thunderstorms in the topics that maintains its identify for 24 hours or more. A common phenomenon in the Gulf and Caribbean.

TROPICAL DEPRESSION: Rotary circulation at the ocean's surface, highest constant wind speed 38 miles per hour (33 knots).

TROPICAL STORM: Distinct rotary circulation, constant wind speed of between 39 and 73 miles per hour (34-63 knots).

WALL CLOUD: The area immediately surrounding the eye of a hurricane, forming a vertical column up to 20 miles high and 20 to 30 miles wide. While the heaviest rains and most violent winds occur in this ring, the eye it surrounds is calm.

Based on information from the Insurance Information Institute, Texas Subscriber Office, Austin, Texas.



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HURRICANE SAFETY TIPS:

ELEVATOR SAFETY PRECAUTIONS

- 1. Elevators may not be able to function during a hurricane. Water may damage the machinery and passengers could become trapped in cars. Telephones may be inoperative and elevator mechanics unable to handle emergencies due to flooded and unsafe roads.
- 2. Make a thorough examination of elevator machine room ventilation, including roof, walls, doors and windows for possible windblown rain leakage. If repairs are necessary, have them made now to prevent water damage to motors. Machine room doors and windows should be made watertight by weatherstripping. All open ventilation should be covered with splash quards.
- Clear out gutters, drains and downspouts to prevent accumulation of rain water which may cascade to floors below and find its way to the elevator shafts.
- 4. When a hurricane approaches, park the elevator car at the top floor so that if an upper floor is flooded, the water will not fall on top of the car and damage its operating panel, door operator, electrical devices and wiring.
- 5. Pull the disconnect switches in the machine room and close and lock the door to prevent the elevator from running during a hurricane. Water that may run down, or rising ground water, may fill the elevator pit, causing shorts and a shutdown if the elevator is left running.
- 6. Once the hurricane is over, check the elevator machine room, all electrical equipment, hoistways and pits before starting the elevators. If water has affected any of these areas, have the equipment inspected before placing the elevators back in service.

Taking these precautions may prevent lengthy elevator shutdowns and unnecessary repair expenses and inconvenience.

Contributed by the Metropolitan Dade County Emergency Operations Center, 5600 S.W. 87th Avenue, Miami, Florida 33173, with the aid of V. Pedre, Sr., of the Paramount Elevator Systems, Inc.



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HURRICANE PREPAREDNESS CHECKLIST FOR OFFICE OR COMMERCIAL BUILDINGS

The following steps should be taken to prepare an office building or other commercial-type building prior to the arrival of a hurricane:

- Cover all glass windows and doors on at least the first floor with shutters, paneling or other protective material such as plywood or masonite.
- 2. In the absense of shutters or paneling, criss-cross glass areas with strips of 2-inch wide masking tape placed 10 to 12 inches apart on the INSIDE of the glass. This should be done on at least the first floor level.
- 3. Move all records and important papers, etc. away from windows. Those on the first floor should be moved to a higher floor or raised off the floor in the event the first floor becomes flooded by either increased tidal action or excessive rainfall.
- 4. Disconnect all electrical appliances and equipment, such as typewriters, copiers, coffee makers, electric clocks, calculators, etc. to prevent their being damaged due to blown transformers or excessive surge when electric power is restored.
- 5. Service and test the building's emergency power generator UNDER LOAD. Generators should be test-run each week under load to ensure they are in good operating condition and available for emergency use.
- 6. Check drains on the roof of the building to ensure that they are clear and able to drain off the heavy rains which usually accompany a hurricane. Clogged roof drains could cause the roof to collapse from weight of accumulated water or cause damage to the interior of the building if water there becomes deep enough to cover vent pipes and run down inside the building.
- 7. Secure or bring inside any outdoor furniture, potted plants or other decorative objects that could be blown about by the hurricane force winds.

Contributed by the Metropolitan Dade County Emergency Operations Center, 5600 S.W. 87th Avenue, Miami, Florida 33173

- 8. Dumpsters (large trash containers) can be secured by lashing two or more together with rope or chains and chocking the wheels. They might also be secured to a tree or telephone pole, if available.
- 9. One or more persons should be designated to remain in the building throughout the storm to continue preparing the building as required and to be available to make emergency repairs. This person (or persons) should be equipped with a battery-operated radio or TV set to obtain information on the status of the storm and any emergency instructions.
- 10. To prevent damage, TV antennas on the roof should be lowered and secured. It is important to remember that TV antennas are often electrically charged and should be allowed to "bleed off" by disconnecting TV sets early on in the building preparations and make lowering of TV antennas one of the last things to do.
- NOTE: (1) It might be advisable to set aside a supply of heavy plastic sheeting, air conditioning duct tape and some sandbags for securing first floor doorways against flood water.
 - (2) It is also suggested that a building security detail be appointed to coordinate hurricane preparedness activities in multiple tenant buildings.





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HURRICANE TIPS: WHAT TO DO WHEN YOUR HOME FREEZER STOPS

IF YOUR HOME FREEZER STOPS RUNNING and will be off for some time, you can take several steps to keep food from spoiling.

Keep the freezer closed. Move the food to a locker plant. Add dry ice if you can get it. Can the food.

Keep Freezer Closed: Open the freezer only to remove food for moving to a locker plant or to add dry ice.

Estimate How Long The Current Will Be Off: Don't worry if you know you can have the freezer running again within a few hours.

When the freezer stops running, the power supply may be off or the freezer itself may be out of order.

1. Try to find out how long the power will be off.

2. Consult the instruction book to determine if there is something you can do to put the freezer back into operation. Or,

Try to find out how long it will take to get a serviceman to put the freezer back into operation.

Estimate How Long Food Will Keep: Try to estimate about how long the food will stay frozen. With the freezer door closed, food will usually stay frozen in a fully loaded cabinet for about two days; in a cabinet with less than half a load, not more than a day.

How long the food in your freezer will stay frozen depends on --

The amount of food in the freezer.

2. The kind of food in the freezer. A freezer filled with meat will keep longer than a freezer filled with baked goods.

The temperature of the food. The colder the food, the longer it will stay frozen.

4. The freezer itself. A well-insulated freezer will keep food frozen much longer than one with little or no insulation.

5. Size of the freezer. The larger the freezer, the longer food will stay frozen.

Contributed by the Metropolitan Dade County Emergency Operations Center, 5600 S.W. 87th Avenue, Miami, Florida 33173

<u>Consider the Freezer-Locker Plant</u>: Make arrangements with your local locker plant to take care of food in an emergency. Then, if an emergency does occur:

Call the locker plant to see if it is operating, and if so, whether it has room for your food. If space is available:

- Wrap the food in plenty of newspapers and blankets, or use insulated boxes.
- 2. Rush the food to the locker plant.

Use Dry Ice If You Can Get It: If locker space is not available and it appears as if your freezer will be stopped for longer than a day, use dry ice to keep foods cold. You may be able to get dry ice from a local dairy or a cold-storage warehouse. The more dry ice you use, the longer the food will keep frozen.

Twenty-five pounds of dry ice should hold the temperature of a half-full 10-cubic foot cabinet below freezing for two or three days. Food in a fully-loaded cabinet will stay frozen for three to four days if you put in dry ice soon after the freezer goes off. Use 50 pounds of dry ice for a 20-cubic foot freezer. (To prevent burns, wear gloves when handling dry ice.)

Move food from the freezing compartment to the storage compartment. Put heavy cardboard directly on the packages of frozen food and then put the dry ice on top of the cardboard.

Should You Cover The Freezer With Blankets? If you have put dry ice into the cabinet, you may cover the freezer with blankets, quilts, or some other covering. Put crumpled newspaper or excelsior between the cabinet and blankets.

If you put blankets or other coverings on the freezer, be sure to pin or fasten them so that they will not cover the air-vent openings. The power may go on unexpectedly and ventilation will be needed.

What Should You Do With Food If It Thaws? Occasionally, frozen foods are partially or completely thawed before you discover that the freezer is not operating. Partial thawing and refreezing does reduce the quality of foods, particularly fruits, vegetables and prepared foods. Red meats are affected less than many other foods.

You may safely refreeze foods that have thawed if they still contain ice crystals or if they are still cold -- about 40 degrees Fahrenheit -- and have been held at this temperature no longer than one to two days after thawing. Foods warmed to 40 degrees Fahrenheit or higher are not likely to be fit for refreezing.





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You Can Refreeze Thawed Fruits: Fruits usually ferment when they start to spoil. A little fermentation will not make fruits dangerous to eat, but may spoil their flavor. You can refreeze thawed fruits if they still taste and smell good. Or you can use them in cooking and baking or for making jams, jellies, and preserves.

Be Careful When You Refreeze Thawed Meats and Poultry: Meats and poultry become unsafe to eat when they begin to spoil. Examine each package of food before you decide what to do with it. If the color or odor of the thawed food is poor or questionable, get rid of it. It may be dangerous!

Tests show you can refreeze beef, veal and lamb that show no sign of spoilage. If a package has been opened, the meat should be rewrapped before refreezing.

Be Careful When You Refreeze Vegetables, Shellfish and Cooked Foods: Often, you can't tell by the odor whether vegetables, shellfish and cooked foods have spoiled. Bacteria multiply rapidly in these foods. Do not refreeze any of these foods when they have thawed completely. If ice crystals are still in the food, you can refreeze it immediately. Usually it is safe to do so, even though the quality may suffer. If the condition of the food is poor or questionable, dispose of it. It may be dangerous!

Do Not Use Melted Ice Cream.

Refreeze Foods Quickly: Clean your freezer before refilling. When you refreeze thawed food, freeze it quickly.

To quickly refreeze thawed food, take it to a commercial locker plant. Chill to O degrees Fahrenheit or below before taking the food back to your home freezer. Wrap the food well with newspapers and blankets before moving it to or from the freezer plant.

To refeeze food at home, turn the adjustable temperature control (if your freezer has one) to the coldest position. When the current comes on again, it will run continuously and food will freeze quicker. Place the warmer packages against the refrigerated surface if possible, but pile them so air can circulate around them. After the food is well frozen, turn the temperature control to its usual setting. If the freezer is too full, move some of the colder packages to the refrigerator, and return them gradually to the freezer. Foods that have been frozen and thawed require the same care as food that has never been frozen. Use refrozen foods as soon as possible.

BE PREPARED:

- Make arrangements to take your food to a nearby locker plant in an emergency.
- 2. Try to locate a source of dry ice in your community.
- 3. Keep canning supplies on hand, and keep canning equipment in good working order. At times, the only practical solution to save thawed food is to can it.
- 4. During the seasons when power failure is frequent in your community, it's good insurance to run the freezer at a much colder temperature than normal.
- 5. In choosing a freezer, select one with good insulation. A well-insulated freezer keeps food cold hours longer than a poorly insulated one should the power go off.
- 6. Use care in preparing, packaging and freezing food. The more sanitary you are in preparing food for the freezer, the better it will be able to withstand stoppage of the freezer, Sanitary preparation means fewer bacteria to cause spoilage. Frozen bacteria are not dead bacteria; when they warm up, they become active.

Prepared by Evelyn B. Spindler, nutritionist with the Federal Extension Service, in consultation with the Human Nutrution Research Division, Agricultural Research Service, U.S. Department of Agriculture.





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HURRICANE TIPS: INSURANCE PROTECTION INFORMATION

Insurance protection for hurricane damage is more complex than commonly understood. There are so many companies selling so many different coverages that one common rule seldom applies to all. Following are some general guidelines.

AUTO: Insurance for autos is written in three basic coverages: liability, collision and comprehensive. It is the comprehensive insurance that covers losses caused by wind and flood, including damage from fallen trees or power lines and blowing debris. Your insured auto is normally covered in hurricanes.

HOME: There are two basic coverages for a homeowner: homeowner's and flood insurance.

A homeowner's policy is the standard coverage most people have. It is written in several formats but only covers water damage if the "wind opens the roof, windows or some other part of the house." This insurance does not cover damage caused by water rising to a point where it seeps in around doors, windows, etc. This is only covered by flood insurance.

FLOODING: Damage caused by flood, waves or tidal water is not normally covered by any of the homeowners' forms. In flood hazardous areas, the federal government does make flood insurance available. Insurance agents who sell homeowners' coverage also sell flood insurance on behalf of the federal government.

COVERAGES: "Types" of Property. To evaluate the different homeowners coverages, we start by discussing three different "types" of property. Understanding these "types" helps not only to determine what's covered by a policy, but also to know which claims will or will not be paid following a hurricane.

Building Exterior: Examples: roof (including tiles, shingles, etc.), walls, (including windows, their frames and screens), siding and fixtures attached to the building (permanently), attached air conditioners, solar water heaters, skylights, etc.

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Building Interior: Examples: walls, ceilings, floors, cabinets attached to buildings, etc. Walls and ceilings are often called structures.

Personal Property: Examples: furniture, clothing, non-attached fixtures (lamps, drapes, etc.) and most personal posessions. The following types are subject to special homeowners' policy limits and are not covered under the flood dinsurance policy: money, securities, deeds, watercraft (inside buildings), trailers or grave markers. These are referred to as contents.

WHY ALL THESE VARIATIONS? Frankly, it would be easier for insurers to provide all-inclusive homeowners, tenants and condominium policies to everyone who wanted one. And it also would be much more expensive. Instead, consumers deserve a variety of product and cost options because their needs and exposures vary according to what they own and where they live. This becomes especially clear with the next item.

SPECIFIC EXCLUSIONS: The following items, which are highly susceptible to wind damage, typically are listed as exclusions (no coverage provided) on homeowners' policies. However, some of these exclusions can be covered for wind damage by the purchase of endorsements to the basic polciy. The exclusions:

- 1. Screening and supports around pools, patios, etc.
- Fences, property line walls and seawalls.
- Greenhouses, trellises, cabanas and outdoor equipment (including TV antennas).
- 4. Structures and other property located over water.
- 5. Awnings or canopies, including their supports (but not storm shutters)
- 6. Certain structures with roof-like coverings of metal, fiberglass, plastic or cloth.
- 7. Trees, shrubs or plants.

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<u>DEDUCTIBLES</u>: All policyholders should be aware of deductibles and special <u>limitations</u> which apply to the insurance contracts they have purchased.

ADDITIONAL COVERAGES:

<u>Debris Removal</u>: When covered property is damaged by an insured peril, the policy also pays for property removal as debris. For example: removal of tiles from a roof destroyed by wind would be reimbursed, but not removal of a fallen tree (unless additional coverage was purchased). Removal of flood-caused debris would be reimbursed by the flood policy.

Temporary Repairs: When a policyholder makes necessary and reasonable repairs after a loss to prevent further damage to the property (this is a contractural obligation), the insurance company provides reimbursement. The National Flood Insurance Program may provide limited reimbursement for costs of sandbagging to prevent flood damage.

Living Expenses: When a residence becomes uninhabitable because of a covered loss, the insurance company pays for a reasonable increase in living expenses (motel room, meals out, etc.) over and above the normal expenses for housing, food, transportation, etc. Flood insurance does not pay this cost.

Rugs installed over finished floor are considered contents. Rugs installed over unfinished floors are part of the structure.



Insurance Information Institute Texas Subscriber Office 100 N. Interregional Hwy., Suite 3200 Austin, Texas 78701 (512) 476-7025

TEXAS INSURANCE FACT FILE

Subject: No. TEXAS HURRICANE AWARENESS PROGRAM

CAT.-3

Date:

January 21, 1983

1. WHEN IS THE "HURRICANE SEASON"?

The hurricane season in Texas is from June through October. However, this does not mean that they cannot strike the Texas coast during other months, only that historically no hurricane has hit Texas before June or after October.

2. WHAT IS THE TEXAS HURRICANE AWARENESS PROGRAM?

The Texas Hurricane Awareness Program is an effort to remind longtime residents and alert newcomers to the Texas coast of the destructive power of hurricanes and to provide them with preparedness information. The program was initiated with the idea that both lives and property can be saved if people will familiarize themselves with hurricanes and some elementary precautionary measures that should be taken in the event of a storm.

3. WHAT IS THE PRINCIPAL FEATURE OF THE HURRICANE AWARENESS PROGRAM?

The principal feature of the program is distribution of the brochure "Texas Coastal Hurricane Preparedness Information" prepared by the Texas Catastrophe Property Insurance Association (TCPIA). The brochure provides keys to hurricane survival, covering all important steps from advance precautions through recovery. Additionally, the brochure includes a storm travel guide, hurricane facts and history relevant to the Texas coast, important terms to know, guidelines relating to insurance and storm recovery, and information and maps on tracking hurricanes.

4. HOW CAN CITIZENS OR GROUPS OBTAIN THE BROCHURE?

"Texas Coastal Hurricane Preparedness Information" may be obtained by writing to the Texas Subscriber Office of the Insurance Information Institute, 100 N. Interregional, Suite 3200, Austin, TX 78701.

5. WHAT ROLE DOES THE NEWS MEDIA PLAY IN THE PROGRAM?

Newspapers and radio and television stations play a vital role in the program. They print and broadcast awareness and preparedness information that might not otherwise reach the coastal population. They are a very important asset for the success of the program.

BACKGROUND ON THE HURRICANE AWARENESS PROGRAM Fact Sheet....page 2

6. WHO IS RESPONSIBLE FOR THE HURRICANE AWARENESS PROGRAM?

The Texas Catastrophe Property Insurance Association serves as the lead organization for the hurricane awareness program. Besides providing for administration and continued financial support, the member insurance companies of TCPIA contributed in excess of \$150,000 to fund the program during its first five years.

The program has, of course, received important advice and assistance from many agencies and groups throughout its existence, including the Governor's Division of Emergency Management, Texas A&M University, the Bureau of Economic Geology at the University of Texas at Austin, the Texas Coastal and Marine Council, the National Weather Service's Office of Disaster Preparedness and the National Hurricane Center.

The Texas Subscriber Office of the Insurance Information Institute, on behalf of the TCPIA, played a major role in establishing the program and continues to prepare and distribute loss prevention materials to the press and public.

7. BESIDES THEIR LEADERSHIP ROLE IN THE HURRICANE AWARENESS PROGRAM, WHAT ARE THE PRIMARY RESPONSIBILITIES OF THE TCPIA?

The Texas Catastrophe Property Insurance Association was established by the Texas Legislature in 1971 to provide a means for individuals in high risk areas in 14 coastal counties to obtain insurance protection against the hazards of windstorm and hail. Virtually every company licensed to write property insurance in Texas participates in the program.

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TEXAS INSURANCE FACT FILE

Subject:

NOAA WEATHER RADIO

No. CA

CAT.-2

Date:

February 27, 1984

The National Oceanic and Atmospheric Administration (NOAA) of the U.S. Department of Commerce has set up a network of 372 nationwide special frequency radio stations which provide around-the-clock broadcasts of the latest weather information from National Weather Service offices. Taped weather messages are repeated every three to five minutes and are routinely revised every one to three hours, or more frequently if needed. The broadcasts are tailored to weather information needs of people within the receiving area.

Under a January 1975 White House policy statement, NOAA Weather Radio was designated the sole government-operated radio system to provide direct warnings into private homes for both natural disasters and nuclear attack. This capability supplements warnings by sirens, commercial radio and television.

Forecasters can activate specially designed warning receivers. The receivers are either (1) automatically turned on so that the warning message is heard, or (2) sound an alarm indicating that an emergency exists, alerting the listener to turn the receiver up to an audible volume. "Warning alarm" receivers are especially valuable for schools, hospitals, public safety agencies, and news media offices.

NOAA Weather Radio broadcasts are made on one of seven high band FM frequencies ranging from 162.400 to 162.550 megahertz (MHz). Although these frequencies are not found on the average home radio now in use, weather radios are available in retail stores. Some new AM/FM radios on the market offer the "weather band" as an added feature.

Approximately 90% of the U.S. population is within the listening range of a NOAA Weather Radio broadcast. The broadcasts can usually be heard as far as 40 miles from the National Weather Service antenna site. Listed below are NOAA Weather Radio stations for Texas.

Location	Frequency	Location	Frequency
Abilene	162.400 MHz	Houston	162.400 MHz
Amarillo	162.550 MHz	Laredo	162.475 MHz
Austin	162.400 MHz	Lubbock	162.400 MHz
Beaumont	162.475 MHz	Lufkin	162.550 MHz
Big Spring	162.475 MHz	Midland	162.400 MHz
Brownsville	162.550 MHz	Paris	162.550 MHz
Bryan	162.550 MHz	Pharr	162.400 MHz
Corpus Christi	162.550 MHz	San Angelo	162.550 MHz
Dallas	162.400 MHz	San Antonio	162.550 MHz
Del Rio	162.400 MHz	Sherman	162.475 MHz
El Paso	162.475 MHz	Tyler	162.475 MHz
Fort Worth	162.550 MHz	Victoria	162.400 MHz
Galveston	162.550 MHz	Waco	162.475 MHz
		Wichita Falls	162.475 MHz



Insurance Information Institute

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TEXAS INSURANCE

Subject: No.

Date:

Deaths Due to Major Texas Hurricanes

CAT.-4 June 29, 1984

The table below lists the hurricanes and major storms on the Texas coast for which the largest number of deaths have been recorded. Fortunately, the number of deaths has generally decreased since the early part of this century due mainly to early warning systems that better prepare people to escape the wrath of violent weather.

Texas' most recent hurricane was Alicia which came inland on the west end of Galveston Island in the early morning hours of August 18, 1983. Twenty-one people lost their lives directly or indirectly from Alicia. The causes of death ranged from falling trees and drownings to fires caused by candles and carbon monoxide poisoning from a gas generator used in the storm's aftermath.

Despite the variety of tragic mishaps caused by Hurricane Alicia, most hurricane-related deaths are caused by drowning. It is estimated that nine out of 10 deaths occur this way.

DATE	HURRICANE	DEATHS IN TEXAS
Sept. 8-10, 1900	Great Galveston Hurricane	6,000-8,000*
Sept. 14, 1919	Corpus Christi Hurricane	284
Aug. 16-19, 1915	Galveston Hurricane	275
Sept. 15-18, 1875	Indianola Hurricane	176
July 21, 1909	Velasco Hurricane	41
Aug. 13, 1932	Freeport Hurricane	40
Sept. 4-5, 1933	Brownsville Hurricane	40
Sept. 11-14, 1961	Hurricane Carla	34
July 31-Aug. 5, 1978	Tropical Storm Amelia	32 **
Aug. 18, 1983	Hurricane Alicia	21
Aug. 18, 1916	Padre Island Hurricane	20
July 27, 1943	Port Bolivar Hurricane	19
Sept. 20-23, 1967	Hurricane Beulah	15
July 25, 1934	Rockport Storm	11
Aug. 3-4, 1970	Hurricane Celia	11
June 27, 1957	Hurricane Audrey	9
Aug. 30, 1942	Matagorda Hurricane	8
Sept. 23, 1941	Freeport Hurricane	4
June 28, 1929	Port O'Connor Hurricane	3
Aug. 27, 1945	Matagorda Bay Hurricane	3 3 3
Sept. 17, 1963	Hurricane Cindy	3
Oct. 3, 1949	Freeport Hurricane	2
Sept. 10, 1971	Hurricane Fern	2
Aug. 4-11, 1980	Hurricane Allen	2
Aug. 24, 1947	Galveston Hurricane	1

The Great Galveston Hurricane is the greatest natural disaster in U.S. history in terms of loss of life.

An unusual aspect of this tropical storm was that the resulting drowning deaths occurred in the Texas Hill Country rather than near the area where the storm struck the coast.

DEATHS DUE TO MAJOR TEXAS HURRICANES Fact Sheet....page 2

Sources: "Natural Hazards of the Texas Coastal Zone" (published by Bureau of Economic Geology--University of Texas); "Hurricanes on the Texas Coast" (published by Texas A&M University); "Texas Civil Preparedness Digest," Vol. 26, No. 3 (published by Division of Disaster Emergency Services); Texas Weather, by George W. Bomar.



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TEXAS INSURANCE FACT FILE

Subject:

SAFFIR-SIMPSON SCÄLE FOR HURRICANES

No. CAT.-

Date:

January 21, 1983

The current prevalent system of strength classification for hurricanes is the Saffir-Simpson scale developed in 1974 by Herb S. Saffir, nationally known consulting engineer for hurricane area building standards, and R.H. Simpson, former director of the National Hurricane Center in Florida.

Under this system, there are five categories or grades of hurricanes based on wind velocity and the height of the storm surge. Storm surge is defined as a dome of water 40 to 50 miles across that sweeps across the coastline near the point where the eye of the hurricane makes landfall. If all wave activity could be smoothed, it would be the height of the level water above mean sea level. Superimposed on the level water is tremendous wave activity.

Examples of all five categories of storms which have struck the Gulf Coast are shown below. A "five" is the worst storm possible, and a "one" would be a minimal storm.

Category "three" storms and above are considered to be major hurricanes. There have only been two category "five" storms in the U.S. in this century -- Camille which hit Mississippi in 1969 (with a 25-foot surge and winds in excess of 200 mph) and the Labor Day hurricane which struck the Florida keys in 1935.

DEFINITION OF THE SAFFIR-SIMPSON SCALE

Category	Winds (mph)	Surge (ft.)	Examples: Gulf Coast
1	74-95	4-5	Fern 1971
2	96-110	6-8	Edith 1971
3	111-130	9-12	Betsy 1965
4	131-155	13-18	Carla 1961
5	over 155	over 18	Camille 1969

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TEXAS
INSURANCE
FACT FILE

Subject:

Casualty Losses on Income Tax Forms

No.

CAT.-28

Date:

February 28, 1984

In a flood or other catastrophe such as a hurricane, even in an individual situation, it is not uncommon to find that people either did not have insurance to cover the damage, or those who did were not adequately covered.

Those property and casualty losses not covered by insurance may be deducted on your income tax return. It is important to take the correct action to minimize tax liability.

Documentation of loss and understanding of basic tax rules is critical to receive full deductions. The following information may be used as a guide to maximize the tax savings.

ACTION TO BE TAKEN IMMEDIATELY

Make a list of all losses by item. Necessary information is as follows:

Description
Date acquired
Cost (or tax basis)
Fair market value before and after damage
Insurance reimbursements received

Document damage as to type and dollar amount.

Seek independent appraisals Obtain comparable values Photograph damage

Retain receipts of all costs incurred.

Repairs
Loss determination expense (appraisals, photography, tax consultation, etc.)

TAX CONSIDERATION

NON-BUSINESS PROPERTY

Casualty losses are claimed on Form 1040, Schedule A. Form 4684 may also be appropriate.

Casualty losses must be reduced by \$100.

After 1982, a taxpayer's total losses (after deducting the \$100 for each loss) are deductible only to the extent that they exceed 10 percent of adjusted gross income.

Your tax loss is the lower of fair market value decline or your tax basis, either of which is reduced by insurance proceeds.

CASUALTY LOSSES ON INCOME TAX FORMS Fact Sheet...page 2

Insurance proceeds in excess of your tax loss may result in a gain. However, this gain may be postponed if you purchase similar property within two years.

For real estate, the entire parcel including land, structure and improvements is treated as one item for loss purposes.

For personal property, losses should be determined on an item by item basis.

Living expenses paid while your home is being repaired are not deductible. However, insurance proceeds for those expenses do not reduce your loss.

Consider all losses (books, toys, landscaping, etc.).

BUSINESS PROPERTY

For total losses, loss is tax basis less salvage value less insurance proceeds.

For partial losses, loss is the lesser of decline in value or basis reduced by insurance proceeds.

For real estate losses, separate components (land, structure, improvements) are treated as separate items.

Inventory losses are deducted as cost of goods sold. Insurance proceeds should be included in income.

Losses are not reduced by the \$100 amount applicable to non-business property.

Losses of potential income are not deductible.

TAX RETURN

If your return was extended on April 15, remember that it is due on August 15. If you need additional time, request an extension for filing until October 15 by filing Form 2688 by June 15. It is possible to obtain extension of time to file your return by using casualty loss as a reason.

If the President declares a disaster area that includes your location, the losses may be deducted on the prior year's return. If no declaration is received, losses are deducted on your current year's return.

SOURCES

Sources include Internal Revenue Service Publications #547, #551, #584, and the Austin Chapter of the Texas Society of Certified Public Accountants.





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Boating It

Boat owners who are on the coast as a hurricane is approaching will receive ample warning through the advisories and bulletins of the National Weather Service. All boats, no matter what their size, should have some sort of radio aboard even if it is only a small transistor set capable of receiving commercial broadcasting stations. In this way the boat owner can remain aware of general weather conditions. At the first indication of possible danger the boater should return to shore. Next, he should decide what to do with the boat to ensure that it will survive the storm undamaged.

There are a number of actions the boater can take. Facilities and time permitting, large boats should be put in dry storage. If the boat is trailerable it should be pulled out of the water at a ramp and moved out of the area at the same time the boater is moving inland to a safer location.

Should a boat owner find himself without sufficient time to get his boat out of the water, these suggestions by Talbot F. Hamlin will help. They appeared in an article entitled "When You Get Caught-Things That Will Help in Squall or Hurricane" published in Yachting, October, 1955.

- 1. Know a good hole and go there in time.
- Be sure you have on board adequate anchors, enough rode (at least one should be 250 feet or longer), and plenty of docking lines of sufficient length and diameter.
- Keep your gasoline tanks full and your engine in good running condition at all times. You don't know when a sudden emergency may make it invaluable.
- 4. If you are at a pier, get on the lee side, be careful of your docking lines, and, in the case of hurricanes, judge if the piles are high enough.

If not, leave the pier and anchor in the safest place you can find (or, if you have to, run free).

(Excerpted from Storms, People and Property in Coastal North Carolina, developed by Simon Baker, UNC Sea Grant College Program and Geography Department, East Carolina University, August 1978)

- Get your engine running when emergency threatens. Then leave it out of gear or put it in gear, as conditions indicate.
- 6. Keep your mooring slack, but take care not to override it. If you are using power when at anchor, be careful not to have so much slack in the anchor rode as to create a danger of fouling it in your propeller.
- 7. Have plenty of chafing gear, and use it.

With these precautions a modern vessel can face squalls and gales confidently with a good promise of coming through undamaged, and with crew tired, perhaps, but alive and well.

If a boat has been removed from the water on its trailer but will not be hauled away there are some precautions which might be followed. The boat should be covered with a canvas so that it will not fill with rain water. Whether it is covered or not, the plug should be pulled to ensure that any water will drain from the interior. Both boat and trailer may be secured with lines to some substantial object to prevent movement by the wind.

In the case of a small boat which must be left out of doors during a storm it is best to move it to high ground and turn it bottom up. It should be secured to solid objects or, if there are none at hand, metal rods can be driven into the ground and the boat tied to them.

If the owner of a larger boat finds himself in a crowded anchorage he may wish to utilize a three anchor mooring system. This consists of three lightweight anchors placed equidistant from each other around a center point and 120 degrees apart. The anchors are bridled to a common center. A chain and pennant from that center provide a point to which the boat with a short rode can be tied up. The boat is free to swing through a small circle and, no matter what the direction of the wind, there will always be one or two anchors to windward holding it. This system has proven to be very effective under severe weather conditions.

Above all, once a boat has been moored as securely as possible, the boat owner should leave it and not attempt to return to it until after the wind and waves have subsided.





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On the Farm

The low-lying eastern counties of North Carolina are predominantly rural. Hurricanes coming ashore and moving inland frequently have caused damage to farm property and crops in this part of the state. The damage may be caused by high winds or by flooding. In areas close to the sound shores flooding may be the result of storm surges in the sounds. Elsewhere, flooding may be the result of heavy rainfall associated with the storms.

The following information for farmers is taken from the Disaster Handbook for Extension Agents published by the Cooperative Extension Service of Pennsylvania State University.

Protecting Farm Buildings From Severe Winds

High winds can damage farm buildings. The following procedures are recommended to help protect buildings during severe windstorms.

- --Securely close all doors and windows. Try to determine whether the buffeting and force of the wind will break fasteners or hinges. Nail doors and windows shut, if necessary. If the building is tight, open windows slightly on the side away from the wind to help equalize pressure.
- --Nail plywood or boards over large windows and windows with weak sashes.
- --Brace large barn doors and weak walls. Use interior braces on the windward side, and exterior braces on the side away from the wind. If you are uncertain about the direction of the wind, use both interior and exterior braces. Place braces on the reinforced section of the door or wall to distribute the bracing effect over a larger area.
- --Check that roof rafters are securely fastened to wall studding. Use 2 inch by 2 inch metal plumber's straps or 2 inch by 6 inch knee braces to secure rafters, if necessary.
- --Check metal roofing and siding for loose nails. If nails don't tighten when hammered back in, pull them out, use a #12 or #14 metal screw to fill the hole, and renail 3 to 4 inches away; eaves should be nailed every 5 inches.

--Do not use heavy machinery to anchor small buildings. Replacing machinery could be more expensive than replacing a building.

Protecting Livestock During a Flood

Livestock not in a confined area usually can take care of themselves during floods. Do not let them become trapped in low-lying pens.

In broad, level flood plains where flood waters are seldom deeper than 3 or 4 feet, construct mounds of soil on which livestock can stay until flood waters recede. Or carry bales of hay for hogs to climb on. Try to locate these mounds where they will not be washed away by fast-flowing water.

- --Provide feed and water. Water is essential. Thirsty animals will try to break out to get to flood waters. If water is in short supply, limit feed intake.
- --If animals are housed with machinery, fasten bales of straw in front of sharp edges and protruding parts such as cutter bars or crank handles. (Do not use hay, because animals will eat it.) Try to cover wooden paddle wheels on combines or choppers, since these parts can be dangerous if partially broken.
- --Block off narrow passageways where animals would be unable to turn around. A few heavy animals in a narrow dead end can be dangerous both to themselves and the building.
- --Be absolutely certain that herbicides, pesticides, and treated seeds are not even remotely accessible to livestock, and are stored where flood water will not contaiminate livestock feed or water.
- --Turn off electricity at the main switch. Livestock could damage electric fixtures, causing fires or electrocutions.
- --If there is a possibility that dairy barns may become inundated, drive cattle out of the barn. During rapid rise of water, cattle often refuse to leave the barn and may drown if the water rises high enough in the barn.



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Preparing to Evacuate -- What to Do on Your Farm

Insure family safety first. Be certain you have enough time to get to higher ground before access is cut off. If you have time before you receive an evacuation order, the following precautions may help protect farm buildings, livestock and equipment from flood damage.

- --Move machinery, feed, grain, pesticides and herbicides to higher elevations.
- --Construct mounds of soil for livestock, or open gates so livestock can escape high water. Small numbers of hogs can sometimes be saved by bringing them bales of hay to climb on.
- --Animals swim well. The greatest problem for grazing animals will be fences and other obstacles. Try to drive stock through water free of obstructions. Long swims through calm water are safer than short swims through a swift current.
- --Leave building doors and windows open at least 2 inches to equalize water pressure and help prevent buildings from shifting.
- -- If possible, move motors and portable electric equipment to a dry location.
- --Disconnect electric power to all buildings which may be flooded. If in doubt about how to disconnect power, call your utility company.

Dairymen who anticipate extensive flooding should:

- --Check with a veterinarian to be sure cattle are properly immunized before being exposed to flood waters:
- --Check with the Department of Health concerning approval of temporary milking facilities;
- -- Try to obtain standby equipment or services for emergency milk pickup;
- --When possible, move grain out of reach of flood water.

Tie down lumber, logs, irrigation pipes, fuel tanks and other loose equipment or material.

Prepare immovable power units and machinery for flooding:

- --Seal radiator openings (tighten caps and plug overflow);
- -- Remove air cleaners and carburetors; seal openings.
 Use material strong enough to withstand water
- --Fill oil reservoirs. Plug breather pipes and openings;
- -- Fill bearings with fresh lubricant;

- --Protect open gears, sprockets, pulleys and wearing and cutting edges of machinery with lubricant or rust inhibitor;
- --Drape polyethelene sheeting over bell ends of motor. Tie securely with cord on cylindrical part of motor housing, or fasten with a strong rubber band.

Safety of Flooded Garden Produce

If flood waters have covered a garden, some produce will be unsafe to eat. The safety of unharvested fruits and vegetables will depend on:

- --kind of produce;
- --maturity of produce at the time of flooding;
- -- time of year flooding occurred;
- --severity of flooding (depth of water and silt);
- --duration of flooding;
- --bacterial content of floodwater;
- --likelihood of contamination from sewage or other bacterial contaminants.

Immature Produce

In general, fruits and vegetables which were immature at the time of flooding should be safe to eat by the time they are ready for harvest. For additional safety, disinfect produce (see below) and cook it before eating.

Mature Produce

Unless flooding was light and there is no danger of bacterial contamination from floodwater, avoid using fruits and vegetables that were ready for harvest at the time of flooding, unless they can be disinfected, peeled and thoroughly cooked. Some fruits and vegetables are more susceptible than others to bacterial contamination.

--Leafy vegetables such as lettuce, cabbage, mustard, kale, collards, spinach, swiss chard, celery and fleshy vegetables and berry fruits such as tomatoes, summer squash, strawberries and peppers would be highly susceptible to bacterial contamination. Silt and other





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- contaminants might be imbedded in the leaves, petioles, stems or other natural openings of fleshy structures, and could be difficult to remove.
- --Root, bulb and tuber crops such as beets, carrots, radishes, turnips, onions and potatoes would be less susceptible to bacterial contamination. Disinfect these vegetables, peel and cook them thoroughly before eating.
- --Produce with a protected fruit or impervious outer skin such as peas, melons, eggplant, sweet corn or winter squash should be washed and disinfected before the outer shell, skin or husk is removed. Then shell, peel or husk the produce, and cook it if possible:

Disinfecting Measures

Thoroughly wash and disinfect any produce before eating.

- --Wash in a strong detergent solution with a scrub brush. Remove all silt.
- --Immerse produce for 15 to 20 minutes in a chlorine solution. Household bleaches contain from 2 percent to 6 percent chlorine. The amount of bleach to add to water depends on the percentage chlorine it contains:

% chlorine in bleach	Volume of bleach to add to one quart water	Volume of bleach to add to one gallon water
2%	3/4 tablespoon	2 tablespoons
4%	l teaspoon	l tablespoon
6%	1/2 teaspoon	3/4 tablespoon

--Rinse thoroughly with safe drinking water.

--Peel, if possible, and cook thoroughly before eating. Refer any specific questions to health authorities or your county extension agent.

Disposing of Sewage and Garbage

Damaged sewage systems are health hazards. It is important to get damaged septic tanks, cesspools, pits and leaching systems into service as soon as possible.

If the area has been flooded, you should wait until the water level recedes before using sewage system.

Trained personnel in local and state health departments will help with these problems. They will be able to advise you about cleaning, repairing and relocating installations, if necessary. Problems with water purity, waste disposal, or pest control should also be referred to them.

Septic Tanks

Most septic tanks will not be damaged by a flood, since they are below ground and completely covered. However, if the tank has been damaged and is filled with silt and debris, it must be cleaned. Use a shovel or sewage pump to clean the tank.

Do not use the sewage system until water in the disposal field is lower than water level around the house.

If tile lines in the disposal field are filled with silt from floodwater, install a new set of lateral tile or perforated pipe in new trenches. Dig the new trenches alongside the old tile lines. Install the tile or pipe according to septic tank system installation specifications. The recommended normal grade is from 2 to 4 inches per 100 feet. Do not use the sewage system until new tiles are laid.

It may be necessary to wait a few days before returning a septic tank system to normal use. It will take some time for water to evaporate from saturated soil, so that the tile field will be able to function again. Septic tank starter materials such as yeast enzymes or horse manure will not be needed.

Temporary Sanitation

Until sewage disposal systems are back in normal working order, use any large container with a tight-fitting lid for a temporary toilet. Line the container with a plastic bag. After each use, add chlorine bleach or disinfectant to stop odor and kill germs.

A chemical camper's toilet will be quite useful in disaster situations.

Garbage

Try to remove garbage as soon as possible to prevent rat infestations and other health problems. Some garbage can be burned. Bury garbage that will not burn. Dig a hole 4 or 5 feet deep, and cover garbage with at least 18 inches of soil.





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Disposing of Animal Carcasses

Prompt and sanitary disposal of animal carcasses is necessary to protect the living animals in an area from disease. Search all pastures for dead animals as soon as possible. Carcasses may have some commercial value, so send them to a rendering plant if possible. If rendering is impractical, dispose of the dead animals on the premises. Use the following procedures:

- --Immediately after finding a carcass, cover it with crude oil or kerosene to keep away dogs, buzzards and vermin.
- --Fat swine are the only animal carcass that will burn satisfactorily. Used railroad ties can be used as starters.
- --Bury other carcasses. Use power equipment if it is available. Choose a site where subsurface drainage will not reach water supplies. Bury the carcasses at least 3 to 4 feet deep, so predatory animals won't be able to reach them. If quicklime is available, cover carcasses with it before back filling. Quicklime will hasten decomposition.



MOBILE HOME OWNERS TIE-DOWN GUIDE

Some important facts about mobile homes and the wind.





Dear Mobile Home Owner:

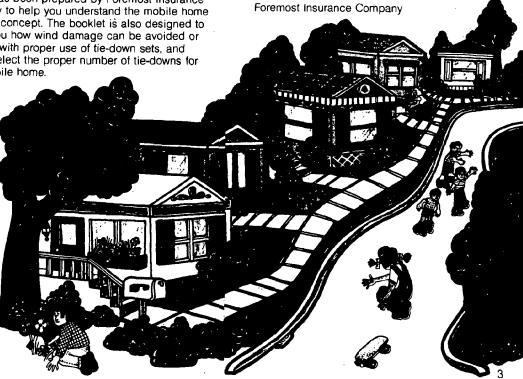
Over 10 million Americans live in mobile homes, and there's good reason why. Today's mobile home is a complete home for year 'round living It's compact, fully equipped and convenient to live in. But the design of the home makes it an object that can be pushed or rolled off its blocks by the wind. It doesn't have to happen! Wind damage to mobile homes can be minimized and in almost all cases prevented with a proper tie-down system.

Tie-downs are a proven and effective way of preventing or reducing wind damage to mobile homes. A tie-down system securely anchors your mobile home to the ground and increases its stability. Most mobile home owners today realize that the simple and economical procedure of tyingdown may save their homes and their lives.

This booklet, Mobile Home Owners Tie-Down Guide, has been prepared by Foremost Insurance Company to help you understand the mobile home tie-down concept. The booklet is also designed to inform you how wind damage can be avoided or reduced with proper use of tie-down sets, and how to select the proper number of tie-downs for your mobile home.

Mobile home manufacturers are now required by Federal law to equip every new mobile home with anchoring straps. Manufacturers build these straps under the exterior of the home so that they in no way detract from the appearance of the mobile home. Always consult your individual manufacturer's specific instructions for proper minimum tie-down installation and anchoring of your mobile

Foremost Insurance requires tie-downs for insurance purposes in some areas of the country. To help safeguard mobile homes from wind damage. we recommend that they be tied-down to at least the 80 miles per hour specifications outlined in this booklet. If you haven't already taken precautions to protect your mobile home from the wind, now is the time to act. Gain peace of mind and protect your mobile home before the storm strikes.





The WIND can be a soft and gentle breeze that rustles through the trees...OR, it can be a terrorizing force that demolishes anything in its path. All areas of the country suffer wind damage. And people in all parts of the country should protect themselves from the strongest sustained winds that have occurred in their particular locality.

Hurricane winds are 75 miles per hour or stronger. Tornadoes can reach windspeeds of several hundred miles per hour in the center. But winds that never become hurricanes or tornadoes can also be destructive. The winds that accompany thunderstorms, and even sudden gusts, cause damage and occur in every state in every month.

Tie-Down Now! The wind doesn't play favorites. Strong winds can occur anywhere, anytime. Even hurricanes, whose official season is from April 1 to November 30 strike in almost every month of the year.

TIE DOWN SYSTEMS consist of steel straps built into the home and which are designed to connect the home to the inground anchors. These are normally placed in pairs, being positioned opposite one another on the sides of the manufactured home.

If outside, over the top stabilizing straps are utilized, a buffer of some sort is used at the upper corners at the roofline to prevent the metal straps from marring the exterior surface of

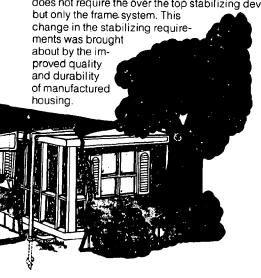
WIND VELOCITIES

☐ 70 mph and under ☐ 80-90 mph
☐ 70-80 mph ☐ 90 mph and above

your home. In addition, there are built-in tensioning devices, either connected to the home stabilizing straps or the stabilizing anchors which produce the tension necessary to securely fasten the home stabilizing systems with the surface of the ground.

For mobile homes produced before June 15, 1976, Foremost requires that both frame systems and over the top systems be utilized. The frame system counteracts the sideward force produced when the wind strikes the side of the house. Over the top systems counteract the lifting force produced by the wind passing over the home.

For mobile homes produced on and after June 15, 1976, to meet Federal Housing Standards, Foremost does not require the over the top stabilizing devices,





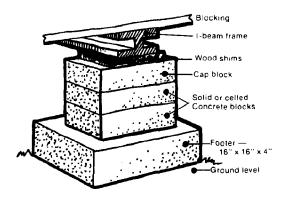
BEFORE INSTALLING THE TIE-DOWN SYSTEM,

be sure that your mobile home is properly placed on a solid and level foundation. Foundations for mobile homes can be basically the same as for any site constructed house or they can be different. However, the basic intent of a foundation is to make certain that the home is properly and evenly supported over the ground surface and that the home remains level. Once the home has been in place for about 90 days, it should be checked again to see if it is still level. If not, your home should be brought back to a level position.

Improper placement on a foundation can result in many serious problems, some of which are the home may sag, it may leak around windows and doors, water runoff through drain pipes can be hampered and doors may stick. Electrical wiring connections may become loose or disengaged from transportation of the home and from set up procedures. Wiring should be carefully checked out by a qualified electrician before you move in.

There are three basic kinds of foundations utilized with mobile homes.

- A full basement style foundation can be used, the same as for any site built house.
- 2. Concrete blocks, either solid or with open celled construction, are also appropriate if placed at the proper positions surrounding the home, as instructed by the manufacturer. If this type of a foundation system is selected, each pier of concrete blocks must be placed on a solid concrete Footer that measures not less than 16 inches by 16 inches by 4 inches thick. This Footer is placed directly on the ground with the concrete blocks placed in the center, one on top of the other until meeting the I beam of the home. If necessary, to make a proper level for the home, wooden shims should be used. If so, these shims should be coated in preservative so that the elements will not cause decomposition.



 Another appropriate mobile home foundation system is the utilization of cylinder jack piers which are bolted to the I beam and then set into a reinforced concrete pad (Footer) which is placed upon the ground.

Important Note: Always keep the number of concrete blocks to the absolute minimum. Your home should be as close to the ground as possible, while allowance for proper ventilation is maintained. For the best results, consult your individual manufacturer's specific instructions.

TO PROTECT YOUR HOME FROM WINDS TO 80 MILES PER HOUR, have at least one set of frame stabilizers for each ten feet of home length. For homes that were constructed before June 15, 1976, over the top stabilizing devices should be evenly spaced along the length of the home and never over windows or doors. There must be at least two over the top stabilizers placed at each end of your home. End sets should be at stud and rafter locations not more than five feet away from the ends of the home. Again, please check your manufacturer's specific instructions for precise detailed information regarding the most appropriate setup for your house.

PROTECTION FROM HIGHER WIND VELOCI-

TIES can be gained by increasing the number of tie-down sets; both frame and over-the-top. The chart shown here indicates the number of each recommended for expected wind velocities.

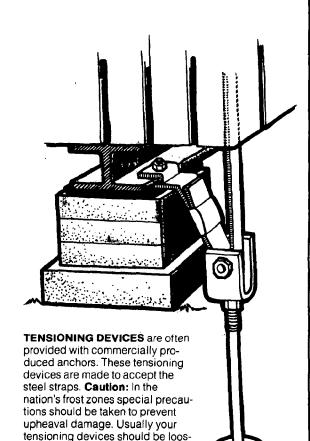


RECOMMENDED NUMBER OF TIE-DOWNS

	10 a	nd 12 ft. wk	12 and 14 ft. wide mobile homes			
	To 50	ft. long	51 to 6	0 ft. long.	61 to 70 ft. Long	
Wind Velocity mph	No. of frame ties	No. of over-the- top ties	No. of frame ties	No. of over-the- top ties	No. of frame ties	No. of over-the- top ties
Up to 70 mph	3	2	4	2	4	2
70-80 mph	5	3	5	3	6	3
80-90 mph 90 mph and	6	4	6	4	7	•
7970	7	5	7	5	8	6

MINIMUM TIE-DOWN REQUIREMENTS have been established by Foremost Insurance Company for some areas of the country. Those requirements are: up to 50 ft. mobile home—3 frame tie-downs per side; 51-70 ft. mobile home—4 frame tie-downs per side; over 70 ft. mobile home—5 frame tie-downs per side. PLUS at least 1 over-the-top tie-down at each end of the home for homes constructed before June 15, 1976.

STEEL STRAPS that have been treated to make them weather resistant should be used for the ties. These straps are now always provided under the exterior surface of new mobile homes when they are manufactured. However, additional galvanized steel straps measuring 1.25" x .035" may be purchased for the mobile home exterior if the home is located in a wind area which requires additional anchoring.



ANCHORS can be of several types, depending upon your particular situation. But regardless of the type of anchor used, it must have a rod made of steel not less than 5%" in diameter, and it must have a tensioning head. In addition, it must be able to withstand a pull of at least 4,725 lbs. without failure.

ened slightly in the Fall to reduce

to a taut position in the Spring.

tension. Tension should be returned



SCREW AUGER ANCHORS,

expanding anchors, or concrete deadmen can be used in sandy or loamy soil. These anchors should be embedded at least 4 feet into anchor the ground.

DRIVE ANCHORS

will probably be needed in rock or coral.

ALL ANCHORS should be installed as nearly vertical as possible. The heads of the anchors should come to rest next to the ground, and should be directly below or just inside the edge of the mobile home.

CABANAS, EXPANDO UNITS AND PATIO

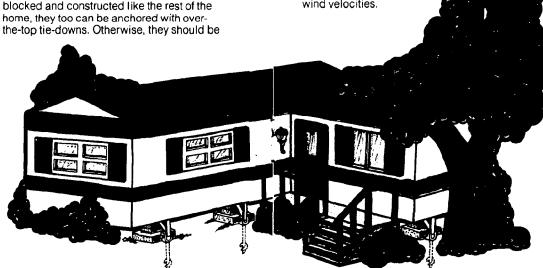
AWNINGS need to be secured too. If they are



anchored with two rows of steel rods at least 5%" in diameter. One row of rods should be attached to the outermost edge of the extension, and the other row should be at the edge attached to the mobile home, or midway between the home and the outside edge. Spacing between the rods should not exceed 12 feet, and the rods should be bolted to the roof of the attachment. Patio anchors can be used in concrete slabs poured beneath the home.

THE COST OF TYING-

DOWN is not excessive. In most areas, equipment plus installation will range from about \$200 to \$450 depending upon soil conditions, the length of the home, and maximum expected wind velocities.





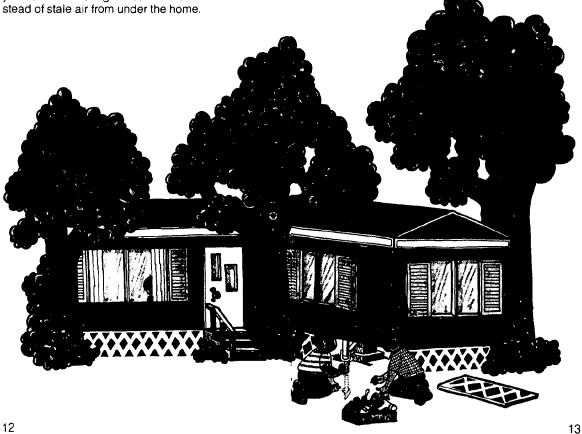
IN ADDITION TO TYING-DOWN, more protection can be obtained by locating your mobile home with the narrow end facing prevailing winds. This reduces the surface area exposed to the impact of the wind.

TREES, BUSHES AND SMALL HILLS provide natural barriers that help protect your home. Two or more rows of trees are more effective than single rows.

SKIRTING on mobile homes should be lattice or openwork. They offer less resistance to the wind and help reduce the wind's lifting forces. Lattice or openwork skirting also provides cross ventilation under your mobile home. This allows your furnace to bring in fresh outside air instead of stale air from under the home.

ENCOURAGE YOUR NEIGHBORS to tie-down their homes too. Your mobile home could still be severely damaged if your neighbor's mobile home is blown off its blocks into your well-secured home.

WHEN A STORM WARNING IS SOUNDED, go to the nearest shelter. Damaged structures and flying debris of any kind can cause injury. Take maximum precautions for your own safety.





FOREMOST INSURANCE COMPANY, as the nation's leading insurer of mobile homes, wants to give you as much factual and up-to-date information as possible to make living in your mobile home safe and pleasurable.

Foremost's experience and statistics over the years indicate that tying-down is the simplest and most consistently effective way of minimizing or preventing wind damage to mobile homes. Tie-downs are recognized by federal, state and consumer agencies as a major safety feature for mobile home living. The National Weather Service, the Red Cross and the National Safety Council urge all mobile home owners to tie-down without delay.

If you haven't already taken precautions to protect your mobile home from the wind, now is the time to act. Protect your mobile home before the storm strikes.

NOTES				
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For more information regarding Mobile Home Safety or Insurance write:

Foremost Insurance Company Public Relations Department P.O. Box 2450 5800 Foremost Drive Grand Rapids, Michigan 49501





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COLUMBIA

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Advances are numbered consoculively for each storm to the forects possible for an analysis of the forest possible for the forest possible forest possible for the forest possible for the forest possible forest possible for the forest possible for the forest possible forest possible for the forest possible for the forest possible forest possible for the forest possible for the forest possible forest possible for the forest possible for the forest possible forest possible for the forest possible for the forest possible forest possible for the forest possible for the forest possible forest possible for the forest possible for the forest possible forest possible for the forest possible for the forest possible forest possible for the forest possible for the forest possible forest possible for the forest possible for the forest possible fore

HOM TO TRACK A HURRICANE

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During a Weather Emergency, stay tuned to a local radio or TV station for the latest advisories and warnings, and orders to evacuate.

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HURRICANES are tropical cyclones in which work seach confiant speed of 47 miles per frou or more, and brow in a large spiral around a realastey calm center-the eye of the furricane. Every year, these vident storms bring destruction to coastlines and islands in their erratic path.

HURRICANE CATEGORY BY WIND VELOCITY
WINDS STORM TIDE:

74 — 95 MPH 96 — 96 MPH 130 — 111 MPH 131 — 131 MPH ABOVE 155 MPH mean high tide

KEEP THIS BROCHURE—It may save your life Follow all evacuation orders, even if weather conditions do not appear threatening.

Metropolitan Dade County Office of Emergency Managemei 5600 S.W. 87 Avenue Miami, Ft. 33173

PACIFIC OCEAN

MEXICO

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FOR HURRICANE INFORMATION CALL NOW: HURRICANE HOTLINE 596-8735, RED CROSS 576-4800 PROVIDED BY DADE COUNTY IN THE INTEREST OF THE LIFE & SAFETY OF DADE COUNTY CITIZENS



Advance Hurricane Preparations

The hurricane season is from June 1 to November 30. Here are some steps you should take, even before a hurricane watch or warning is announced:

Check to be certain that your emergency equipment is in good working order, and that you have enough supplies to last several days.

Obtain and store materials necessary to properly secure

your forme.
Contact the utility company about any tree limbs that could come in conteat with power lines.
Keep trees and shrubery properly trimmed during hurri-care season. Once a turnicine watch is amonumed, do not tim

if you plan to stay home, make sure you have these items;

☐ Bleach

If you expect to exacuate your home in the event of a fuurficene, plan in advence, where to stay, how to get there, etc.
if you plan to go to a refuge, you should bring:

the bear to the control of the control of the	☐ Can opener	(non-electric)	☐ Medicine and baby	food	□ Blankets or sleeping	pag	☐ Identification and	valuable papers	(insurance)	□ Portable ice chest	
and the second s	Canned food, milk	and beverages	□ Water (1-2 quarts	per person per day)	☐ Eating utensils	□ Battery operated	radio	☐ Flashlight	□ Batteries	□ Cards, games,	books

Boaters

It is important for all boat owners whose craft cannot be intered, to find set harbor, for their boats during the further ricane Watch Peliod and before the Warming is announced. Once a fluritiente Warming is announced, force a further the Warming is announced, force a further the Warming is announced, bridges may be closed at anytime to allow for auto evacuation. Bridges will not be rised at at time that would block escape routes during furnicane evacuation. Stay tured to television, radio, or NOAA weather Padot (162.55 MHz) when a furnicane Watch

Who Should Evacuate?

with few acceptions, everyone living in hurricano zones 1 through 7 and ALL mobile home residents in Dade County should evecuate in MY furricanor extens 8 through 7 along the bapfrown will expendence storm suge flooring har may require evertaintoin in category 1 or 2 hurr recent, and should evecuate in a category or 2 hurr recent. Enter 8 through 25 should evecuate in a category or 5 hurricano Sentral inside this brochure for hurricano zone boundaries.

Make A Plan

There are several ways to survive when a hurricare strikes to the are several ways to survive when a hurricare strikes or your area. Your choice of the following platas will depend on several tectors. You have been experienced as a continuous strike of the continuous state of the continuous strikes and its several strikes and its several strikes the materiare building meets current building codes and is kept in good condition. 2) If your residence is NOT coased through 55 (see and pto controllaries). 3) If aimity mentions are in good health, and 3) If your nested has been several to see a condition of the controllaries is NOT careful with strike the former condition. 2) If your residence is NOT careful with strike the former conditions of the condition of the c

threatens our area When a hurricane

Food, Water, Medicine

□ Double check to be cartain you have adequate supplies of orougheshable foods, boby food in ended, and enderines after least several days. Waterproof contrainers are best. □ I'm you reflighted on affecters to condest sentings. Open task these pre-catefords a welf best foods of the contrainers are best. I when these pre-catefories, a welf is to be called the contrainers by to have days a without electricity. A portable for chest can be used as a without electricity. A portable for chest can be used as a tausstitute reflighted to keep food and beverages cool durber of You might have to depend on your own emergency sources of water and colonig these Effectricity may be sout off as a safety measure when winds reach hurricane for could be interruited for hours or wend toys if a hurricane or could be interruited for hours or wend toys if a hurricane or could be interruited for hours or wend toys if a hurricane or could be interruited for hours or wend toys if a hurricane or could be interruited for hours or wend toys if a hurricane or could be interruited for hours or wend the surface of the properties of the remaining of the could be interruited by the could be interruited by the could be interruited for hours or wend the surface in the form of their considered. So the form with water. Later boil the water in the sand sinks for sanitary purposes in only.

Your Property

☐ Any objects that hurricane winds could blow about should be ted down or housely induced; (ganage cans., patio funiture, garden tools; sign, tools, etc.).

☐ Closes shutters, tash down or remove awnings, brace slicing glass doors and Fench doors.

☐ Taping windows will reduce shattering, but will not prevent windows from breaking, and is necessary only in occupied rooms.

☐ When you're lading down antiermas, keep in mind that if the object your wollding makes swent the slightest contact with a power line; it can give you a serious electrical shocks.

• I you take down your television antierna, unplug the set it.

• In you take bown your feelowson amening, unplug the set first.
• When lowering your citizen's band radio antenna, effectoop it down it possible. It is wor't belescope drown, clock around in all directions and then lower the antenna away from power lines.

□ Don't drain your swimming pool: draining just increases the possibility that the pool will hop bout of the ground. Do 'un off electricity to bool equipment (pump, motor, lighting, chonistides), if the filled pump is exposed, want in with water in proof cover and its securely. Add exits actionine to the bool in provent containmanties).

□ If you have a small boat (the size that can't on a trailer) put the boat one agound, remove the outboard motor, lesh the boat down and half fill with water. Filing a boat on a trailer with water may break your trailer springs and axie.

During the hurricane

Stay Indoors . . .

A room without windows or the center of a room is usually safest.

If the calm hurricane eye passes through your area, con-filme to stay indoors — Unless emergiacy repairs are ab-solutely nedessary. Wind and rain may stop for as little as a few mintules or as longs as half hour or more. Beware: the ward will pack up again quite suddenny and at full intensity, from the opposite direction, possibly with greater force than

Turn off electricity if flooding begins.
If the electricity goes of Live fleshightins rather than candles or kenesen et amps, and be careful with cooking illeme. A gusts of wind through a door or window could start a fire and the life operatment may not be readily available during a hurricane.

Use your telephone to energencies only. Jammed phone lines may obstundenergency calls for police, lirenten, doctors, and disaster units.

Continue to conserve retrigeration. Open the refligeration open set entitle as possible.

Continue to liste to radio or television for amountenems from the National Hurrican Center and local officials. Remain indoors until the officials "all clear" is given, (if you're in a Red Cross retruge, wait for the "all clear" is nonnocement to be made by your refuge coordinator.)

After the hurricane

Pay attention to instructions from official sources such as policy. Emergency Management, and Red Cross. Avoid electrical shock — bont turner failen or low-hanging wires of any kind under any circumstances.

• Stay away from prodeed swith fallen wires in them.
• Don't touch any tree or object that is in contact with Experience of the contact with Use your releptione for emergencies only:

Dewel integer or utility immediately to port hazards such as "thee" power lines, broken gas or water mains, or overturning gas tanks.

 Don't use the prone to experimentations.

 Don't use the prone to experimentations in electric, gas, water, or telephone service. Service Report in electric, gas, water, or telephone service. Service Report in electric, gas, water, or telephone service. Service Report in electric, gas, water, or telephone service. Service Report in electric, gas, water, or telephone service, complete service is generally restored in your neighborhood. Beginning the service is generally restored in your neighborhood, the service is generally restored in your neighborhood.

 Don't gargines cucked howepors and telephone service service is generally restored in your neighborhood. The plant of a communities will countent and preserve for you the dramatic scenes of the the hurrizand estatuction. Barris ishand communities will restored and hard service and the pour Gas or IV antenna again, check in a sill directions and make certain that, if the antenna should fall, it won't touch a power line!



HURRICANE PRECAUTIONS

When a tropical storm poses a possible threat to an erac, a HURSHCANE ALLER is announced. This simply means are a HURSHCANE ALLER is announced. This simply means are a HURSHCANE ALLER is announced. This simply means are as a sign on a HURSHCANE WATCH. The designation does not indicate immediate danger, but serves to caution residents in the area lune to adelly preclaim or equining more than 16 to 24 hours to this favour but serves to caution residents in the area lune to adelly preclaims requiring more than 16 to 24 hours to this favour be staten. Ready the storm shutters. A HURSHCANE WARNING is steade when it is expected that an area will teel the dangerous effects of the hurricane it all agreeously high water, very rough seas, and winds in adoption the storm that is in a sistery preclaims should be taken. Be sure to give yourself plenty of time. Put up the storm shutters.

BEFORE

- Slay away from low-lying beaches or other locations which may be swept by fight lides or storm waves.
 Leave those area early because roads to sale locations may become impassable seweral hours prior to the arrival of humane conditions.
- Stay at home if your house is safe from high water and flash flooding.
 - Bring in everything that could blow away garbage cans, garden floob, furnitine and plants. Remove fimbs from trees that may damage your house or utility wres. Remove ripe coconuls from palm frees.
- Secure garage doors. Awnings which can be moved should be raised and lied securely or taken down.
 Fasten storm shutters or board up windows with good lumber.
- Do not drain your swimming pool. Turn off all electrical power to the pool and remove all loose items from the area. Add extra chlorina to prevent contamination.
 - Boais should be hauled out of the water or strongly mnored. Be sure that there is ample scope in moorings. Avoid trying to secure boats after waters become dangerously rough.
- Make certain your automobile is on high ground, away from freez, peletably in a gradge or other shelter. Fill your tank with gasoline because gasoline pumps cannot be operated it power fails.
- Have a tlasshight in good working condition. If it is necessary to use candles or other emergency lighting and cooking facilities, be careful of fire.
- Fill clean containers with drinking water. Have farge containers of water stored in bathroom to flush toilet if
 - Be especially careful of fires. Have a bucket of sand or your normal supply is interrupted.

 Be sure you have sufficient food on hand that does not need retrigeration or cooking.

- a good fire extinguisher available to put out oil fires. A bathfub filled with water is helpful in case water mains are broken.
- Keep your radio on. A batteny-powered radio is a must in case of bower failure. Follow the progress of the storm on WGBS 710 NEWS, where you'll be the first to hear the latest accutade information.

DURING

- The safest procedure is to "stay put." Don't go out at all, except in emergencies.
 - If you must use your car, be alert for falling trees, fallen wires, and flash flooding.
- It is advisable to keep a window slightly open in your house or apartment on the sade opposite that from which wind is blowing in order to provide ventration and to prevent certain types of wind damage. If high winds blow out a window, open wide a window on the winds blow out a window, open wide a window on the opposite side of the house to prevent futtine damage.
- If you have a "hurricane party," don't drink too much, you must drink at all. You need a clear head in an

☐ Hand can opener
 ☐ Bleach
 ☐ Strong fumber to board up windows.

Other

dry cereals and baby food

drymik

powdered drinks canned goods

- Use your phone for emergencies only.
- In case the eye or center of the hurricane passes of directly over your area, siste may deat and there may be a tail in the wind asting anywhere from a few minutes to a half hour or even longer. Remain in a safe place of, in thesessary, make embraginsy ripadirs. Be cautious, however, since the wind will return from the opposite direction sucherly and possibly with even greater violence. For up-to-the-minute advisories and information, keep lumed to WGBS 710 NEWS on your

AFTER

Metro Dade County Emergency Management Hurricane Hotline 596-8735

- Don't hinder first-aid and rescue work. Stay away from
- Stay away from broken or low harging power lines, as well as metal objects which may be in conflact with damaged power lines. Notify police or utility companies of dangling or broken wires.
 - Do not drive unless absolutely necessary, if you must drive, watch out for debris, fallen wires, washouts and swollen streams.
 - Be on the alert for rising water in streams and rivers even after the neavest rain has errobed.
 Lisen to WGBS 770 NEWS for instructions about the necessity of steritizing drinking water and other
 - If power has failed, don't open freezer chests unless necessary until power is restored or you can obtain dry ice.
 Make a list of damage to your property. precautionary measures.

CHECKLIST FOR A HURRICANE WARNING Batteries for radio and flashight. Cardies and plenty of matches. Cart ank filled with gasoline. Skriatice in freezer. Striatice in freezer. Striation fuel and unit. Extra drinking water. Tub filled with water. Tub filled with water. Loose outside objects stored or secured. Extractic with bandages, adhesive tape. FOR HURRICANE INFORMATION, PLEASE CALL:

antiseptics, etc.

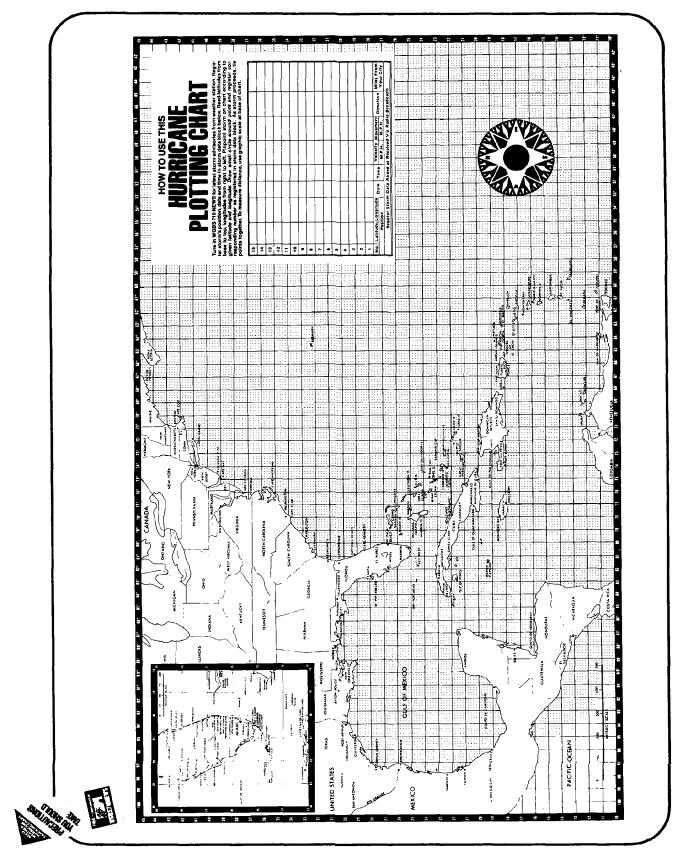
Tree branches tied or cut.

TV antenna taken down.

Pantry well stocked

FREE — COMPLIMENTS OF

When it comes to reporting factual, highly accurate weather conditions, WIGS 37 to INVS leads all other radio stations in South Florida with market exclusive Accu-Weather – the nations largest private weather service. Listen to WGBS 710 INVEX as certified meteorologists evaluate the latest information and keep you informed during Office of Civil Defense, Monroe County 294-9581 Broward County Emergency Preparedness Division 765-5020 Broward County Red Cross 581-4221 Dade County Red Cross 576-4600 Monroe County Red Cross 296-3561 BRO WARD MONROE



Order forms



Federal Emergency Management Agency / National Oceanic and Atmospheric Administration - U.S. Department of Commerce

FEDERAL EMERGENCY MANAGEMENT AGENCY ORDER FORM

The following publications are available in limited quantities and while supplies last from:

Federal Emergency Management Agency P.O. Box 8181. Washington, D.C. 20024.

See page:	Title	Quantity
C-1	Hurricane Safety Tips L-105	
C-3	Survival in a Hurricane (English) wallet card	
not shown	Survival in a Hurricane (Spanish) wallet card	
C-5	Disaster Driving L-116	
C-7	* Storm Surge and Hurricane Safety with North Atlantic Tracking Chart	
C-17	Hurricane-Floods Safety tips for coastal and and inland flooding	·
C-23	Owlie Skywarn's Weather Book	
C-51	Hurricane Poster safety rules and storm surge	

*Also available from NOAA

FEMA ENCOURAGES YOU TO FIND LOCAL SPONSORS TO PUBLISH THESE MATERIALS. WE WILL PROVIDE CAMERA-READY COPY OF THE PUBLICATIONS LISTED ABOVE ON REQUEST.

HURRICANE!

Hurricane Alicia hit the coast of Texas in August 1983. FEMA's 28-minute film Hurricane: follows weather service and emergency services personnel through watches, warnings, landfall, and the aftermath of this powerful storm.

Contact your local FEMA Regional Office (listed in Resources Section) for information on how to obtain this 3/4-inch videotape. Copies will be duplicated on request if a blank 3/4" videotape cassette is provided. (Hurricane! is also available on loan in 16mm film.)



Federal Emergency Management Agency / National Oceanic and Atmospheric Administration - U.S. Department of Commerce

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

See page:	PUBLICATIONS:
C-3	* Survival in a Hurricane (NOAA/PA 70027)
C-5	Hurricane Tracking Chart (Atlantic) (NOAA/PA 77020)
C-7	Storm Surge and Hurricane Safety with Tracking Chart (NOAA/PA 78019)
C-13	Hurricane Tracking Chart (Pacific) (NOAA/PA 77021)
not shown	Some Devastating North Atlantic Hurricanes of the 20th Century (NOAA/PA 77019)

These publications can be ordered from the U.S. Government Printing Office, Superintendent of Documents, Washington, D.C. 20402. Limited copies are also available from: National Oceanic and Atmospheric Administration, National Weather Service, 8060 13th Street, Silver Spring, Maryland 20910.

FILMS/SLIDE SHOWS

A Lady Named Camille (14-minute film)

Depicts how ignoring hurricane warnings can cost lives. Shows impact of devastation. Details civil defense warning procedures.

Hurricane Decision (14 minute film)

Life-saving information for persons in hurricane-prone areas. Explains dangers of storm surge, winds, and inland flooding from hurricanes.

* Hurricane!

Follows weather service and emergency services personnel through watches, warnings, and the landfall and aftermath of Hurricane Alicia, which hit the Texas coast in August 1983.

Hurricane Floise (43 slides/commentary)

Explains ramifications of hurricane awareness/
preparedness or lack of it.

Hurricane Preparedness (49 slides/commentary)

Shows how hurricanes are tracked. Details importance of community communication during weather threat and aftermath of storm.

Films are available on loan from Modern Talking Pictures, Film Scheduling Center, 5000 Park Street, St. Petersburg, Florida 33709 (813) 541-5763.

FOR MORE INFORMATION, CONTACT YOUR LOCAL WEATHER SERVICE OFFICE.

*Also available from FEMA.

WIFEYEARS

TWO HURRICANES CAN HIT U.S. SHORE

the long term a grage according the Severe Weathe Branch of the Mational Oceanic and Atmospheric Administration (NOAA).

knew that hurricane preparedness is a firstery from a roll of the dice but are a some "numbers" that are escient important this time of year and troughout the next several mode.

- There has not been a major hum cane on the East Coast since the late '50's.
- Once a tropical storm receive name and hurricane status it is rated 1-5 according to relative strength (5 is the strongest).
- Even the damaging force of Agnes in 1972 and Alicia in 1983 did not rate higher than a 3!

 No number 5's have made landfall since Camille in 1969. That's more and 15 years ago.

Are your insureds indequately prolitted against damage caused by hurand turning from 7. You, the proressional-insurance—lient Dr

and renters in eligible communities a way to protect their property and contents. There is an important message you can bring to residents and properly owners along the Gulf and East Coast States: standard homeowner's policies don't cover flood damage.

From June through the elber the Federal Insurance tion (1994) the characteristic for the second ment

Awareness Program.

To assist you, we will provide a number of helpful brochures that are free of charges that are also can be easily incerted into your regular matters.

Too many families rely on their homeowner's policy for flood protection. Too many others think that flood insurance is available only in low risk areas. Don't take a chance with your clients. Order today.

FLOOD

You Can Request These Materials Free-of-Charge



Are jum jurished of from the next disease.

(a) Flood . . . Are You Protected?

Provides essential information on the NFIP, including a chart on the limits of coverage for the Emergency and Regular Programs.

(b) Hurricanes and Summer

Describes the threat of flooding during this year's hurricane season.

(c) In the Event of a Flood

Offers practical suggestions on what can be done before, during and after a flood.



Tigs to more aller

Request for NFIP Hurricane/Summer Storm Materials:

name	 	
agency	 	
street	 	
city/state/zip	 	
phone (optional)	 	

Please send the following:

(a) Flood . . . Are You Protected?

(b) Hurricanes and Summer Storms

(c) In the Event of a Flood

QUANTITY



3.